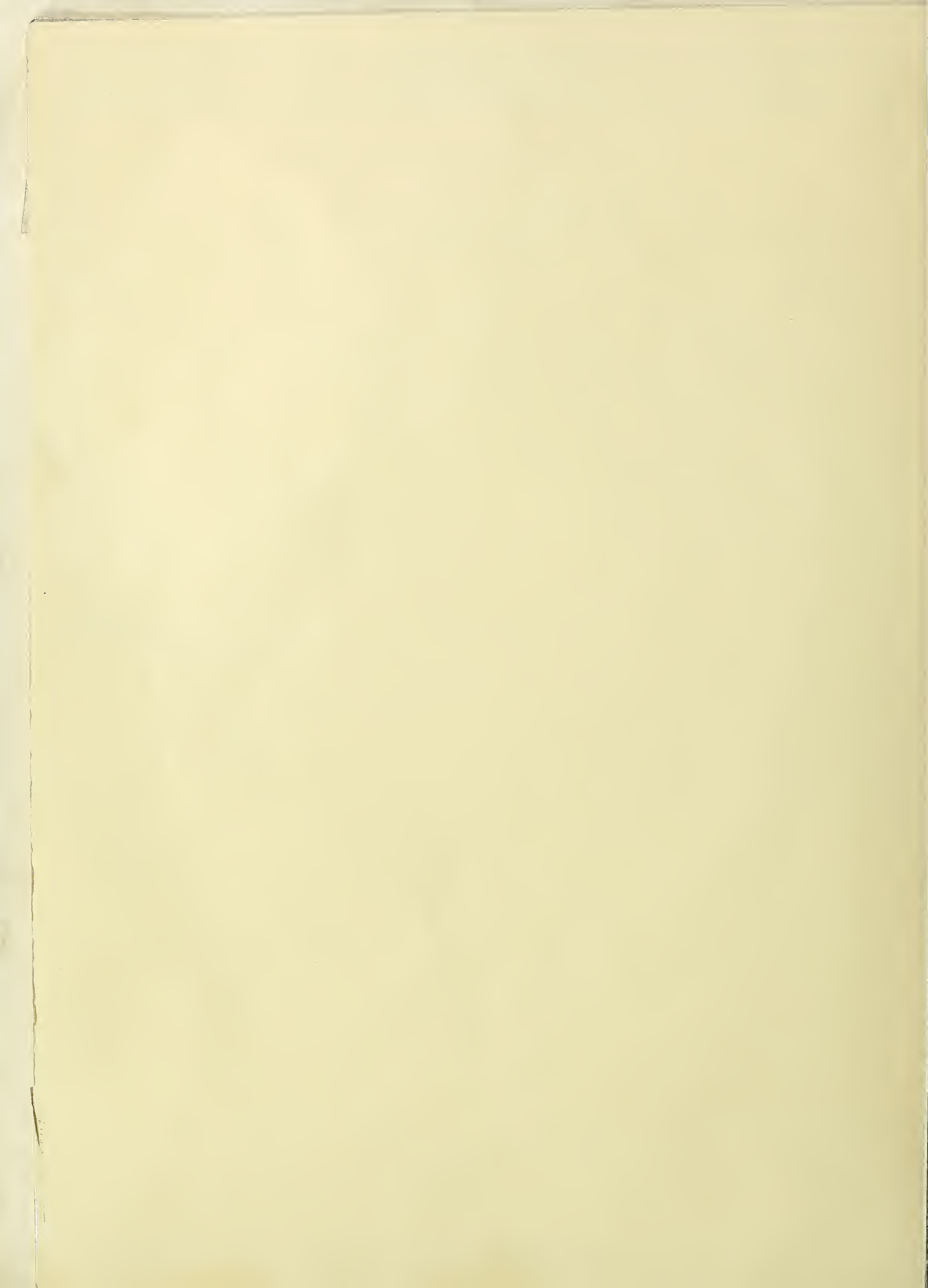


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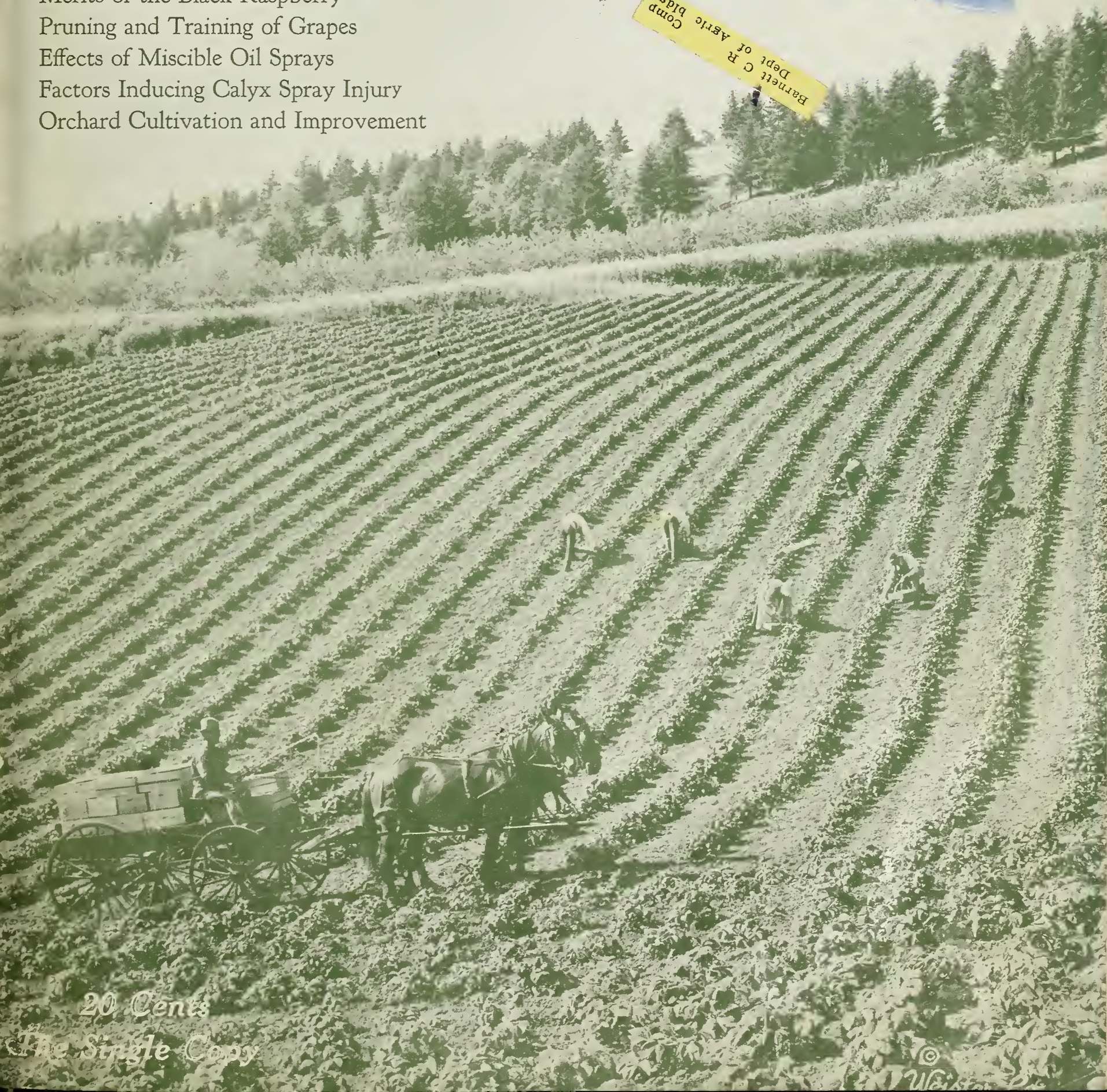
# BETTER FRUIT

*The Pioneer Horticultural Journal of the Pacific Northwest*

MAY, 1922

## Features In This Issue:

Tests in Curbing Melon Pests  
Merits of the Black Raspberry  
Pruning and Training of Grapes  
Effects of Miscible Oil Sprays  
Factors Inducing Calyx Spray Injury  
Orchard Cultivation and Improvement



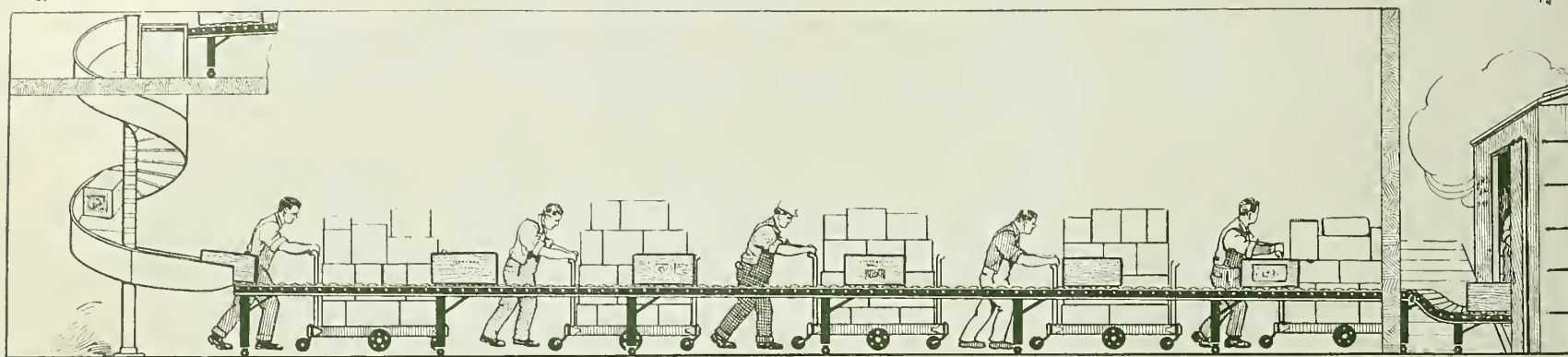
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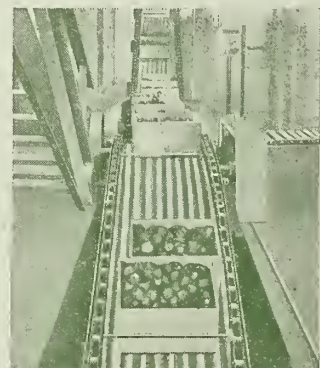
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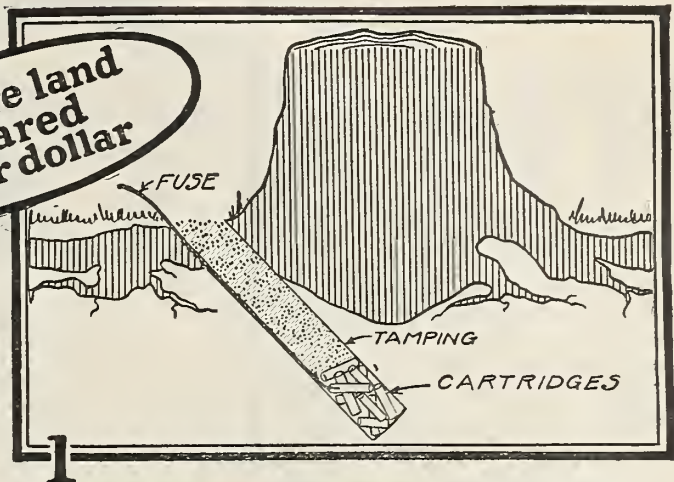
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The subsequent steps in stump blasting will be described in future issues of this paper.

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A letter received recently from our Spokane representative is to the point:

"You will notice the order of Mr. — for 50 Rainier apple trees enclosed. He said he had always dealt with the Washington Nursery and found our trees the very best. He stated that his orchard of Winter Bananas was purchased from us and that at the time of planting he paid us 11c per tree more by the hundred than his neighbor paid for trees purchased from another company. However, Mr. — had a crop two years earlier than his neighbor and in every other respect his trees have proved to be superior."

A number of years have slipped by since the above mentioned transaction took place. As the letter indicates, both orchards referred to are now in bearing.

One planter pinned his faith on good nursery stock as the foundation for a profitable bearing orchard. His faith was well founded to the extent that he was willing to pay more money to insure real quality in his nursery trees.

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# BETTER FRUIT



*The Pioneer Horticultural Journal of the Pacific Northwest*

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VOL. XVI

PORTLAND, OREGON, MAY, 1922

NUMBER 11

## Orchard Cultivation and Improvement

By O. M. MORRIS,

*Head of Horticultural Department, State College of Washington, Pullman*

THE FRUIT trees of our common orchards and gardens all grow well in good soil. There are extreme types of soil in which it is necessary to select special varieties for adaption, but ordinarily any good agricultural soil will produce good fruit trees if the climate is favorable to their development. The financial returns are the more definitely limiting factors to the distribution of orchards than the possibility of growing the trees. The local surrounding conditions that give opportunity for the trees to develop fruit crops regularly are usually the limiting factors to orchard planting.

Wood growth and fruit production are normal activities and in no respects is it necessary to secure an abnormal development of a fruit tree in order that fruit production may be accomplished. Soils that have produced plants for a long period of time, providing those plants have not been burned or carried away, are usually sufficiently loaded with humus to make good fruit lands.

Tillage is one of the best fertilizers that can ordinarily be applied to land that is growing annual crops. This is especially true with soils that are of a clay loam or clay type. Any land that tends to melt or puddle is clearly benefited by carefully developed tillage practices. The normal breaking of the soil, pulverizing, aerating and mixing gives better opportunity for the normal chemical processes of plant food development to take place. The tillage must not be of such a character as to remove the depth of tilled soil from the use of the plants, but rather of such a type as once a year to work over, mix and pulverize the soil to a depth reached by the air in the normal quick changes of climate.

Our tree crops are different from our annual crops in that if they are to utilize the fertility contained in the normal surface soil the tillage processes must be developed so that the root material developing in the surface soil will not all be destroyed each year.

Great progress has been made in orchard development in the last few years. Our

*Do you know how to go about testing your orchard soil to learn what plant food elements it lacks? Lots of growers do not. If you happen to be one of these be sure to read the soil testing methods Professor Morris gives in this article. It will be of interest to every orchardist to read what he has to say of the rather prevalent theory that a different sort of plant food is needed to develop fruits than is required for tree growth. However much the title may smack of "old stuff," the reader will find that Professor Morris is giving present-day trends and ideas.*

processes of tillage have changed from that of using the orchard as a pasture or meadow land to the extreme of constant clean tillage, thus preventing any other growth in the orchard. From this we are swinging back in many regions to the opposite and encouraging a growth of vegetation to cover the ground. This crop falls and decays on the surface year after year without disturbing processes of tillage other than that which is necessary to take care of irrigation or other peculiar local needs.

I seriously doubt whether we know yet what is the best process of orchard tillage. The orchards have been unsatisfactory in their development and we changed the plan. During the process of change an improvement was noticed. This improvement, however, in all probability, could not be fully attributed to the change in methods of soil management. The time we were bringing the orchards into clean tillage was the period in which pruning was the most broadly advocated and generally practiced. During this time, the processes of spraying were greatly improved, and orchard heating was put into practice to a greater extent than ever before.

With the development of orchards far past what our fathers expected, we are again becoming discontent and swing quickly from one extreme to another. I

am convinced that every district that has a distinct climate of its own, will have also its own cultivation and crop management problems.

Most of the country west of the Cascades has an abundant rainfall and during part of the year even an excess of rainfall. Some local districts, however, suffer very distinct droughts in mid-summer and could probably be benefited greatly by local installation of irrigation projects.

There is the advantage of not having extremely cold winters. This gives opportunity for the development of certain types of crops and their growth through a winter period and the development of a type of vegetation that can be used to a very good advantage in maintaining soil fertility.

**PLANT FOOD ELEMENTS**—The plant food materials in the soil that are most commonly considered in fertilizer work are: nitrogen, phosphoric acid and potash. In the soils of irrigated districts nitrogen is most commonly the element forming the limiting factor of plant growth. In Western Washington and Oregon the heavy rainfall of many of the districts causes nitrogen also to be a limiting factor in clean tilled land. This is not so definitely a limiting factor in our forested lands or in the lands heavily covered with a growth of vegetation that is constantly adding decaying material to the soil.

Nitrogen exists in the soil with a combination in the plant tissue or in water-soluble forms. The heavy rainfall then would tend rapidly to carry away all of the nitrogen materials that are not tied up in plant tissue. This is fundamentally the reason why bringing land that has been producing tremendously heavy growth of trees, under cultivation, has soon brought indications of its being exhausted. In Clarke County Washington, some of the soil that has been under cultivation for 25 to 50 years has been found definitely depleted in its nitrogen content. This, of course, has resulted from the fact that the types of agricultural practices on the land had not



been adding yearly a reasonable supply of vegetable tissue to decay there and add its portion of nitrogen and help hold the water-soluble nitrogen in the soil. The rainfall of the district has carried out water during the winter usually more rapidly than during the summer so that the amount of nitrogen material that becomes water-soluble during the winter is to a very large extent lost. The plants start growing in the spring in a soil that is but little, if any, more fertile than it was at the close of the growing season in the previous year.

As a contrast I want to cite you the fact that in the dry land district some little progress is made in the warmer districts by the accumulation of this nitrogen supplied by the crops. There is not ordinarily the rapid growth of many plants in the early spring in your heavy rainfall sections that is common in many districts of lesser rainfall.

I have mentioned Clarke county as an illustration of a district in which the nitrogen supply in the soil has run below that best suited for crop production. With the addition of nitrogen in an available form their crops have shown splendid improvement and there is every reason for them to be optimistic about the permanency of the agricultural development.

Potash is another material that in many localities is wanting in the soil to such an extent that the plants are retarded in their growth. Potash is more readily soluble than is phosphorus. Consequently the heavy rainfall carries out large quantities of this plant food material unless a system of crop and soil management is established that will keep the soil well occupied and the potash that is dissolved will be absorbed by the decaying vegetable material.

Potash and phosphorus are contained as a part of the soil itself. The original source of such material is from the rock from which the soil is made. Soils that are derived from granite and basalt rock or volcanic ash soils are usually rich in both of these materials. However, heavy rainfall over land composed of such materials will in time deplete the supply unless such soils are so handled that a large supply of vegetable material is turned under frequently. Lands that have been in timber or native growth and have received a good mulch of vegetable material each year have usually been found to be well supplied. When such soil is brought under cultivation, however, and given to the use of plants which do not turn back to the soil each year large quantities of vegetable material, a process of depletion sets in and the time required for the wasteful process to absorb the stored material is measured by the conditions existing, but that it will be attained sometime can be marked as an absolute certainty.

We often hear people say that the trees grow all right, but do not have the proper kind of food to cause them to fruit well. This is an error. An abundant supply of

plant food material, with a reduced water supply, may cause trees to be changed from the yearly wood growing habit to that of slower growth and fruit production. It is all the same kind and type of plant food material in the soil and no one of these materials commonly thought of as fertilizer has a special function to perform in the development of a certain part of the plant.

It is a common impression that phosphorus is particularly used in developing the fruit and seed and nitrogen in developing the foliage and wood. This may all be true, but it is only half the truth. Potash and phosphorus are also used in developing the foliage and wood and nitrogen and potash are used in developing the seed, and so on through the list. All of these materials are necessary to development of the plant. And a well balanced proportion of material forms a fertile soil.

The lack of fertility in a soil is usually indicated by poor and unsatisfactory growth of the plant. It may in part be indicated by the lack of satisfactory fruit production. A soil may contain a great quantity of the plant food materials, but if it lacks in one essential, that one essential element will measure the amount of growth and de-

velopment that can reasonably be expected to take place in the orchard. The only way to determine what particular material is under-supplied in the orchard is to fertilize different areas with different material and compare results. At the same time one definite plot should be left unfertilized in order to make sure that our improvement in growth, if any is obtained, is not due to causes other than the application of the fertilizer in question.

**HOW TO TEST SOILS**—One of the best methods of soil testing known is to fertilize one small plot with nitrogen, another with phosphoric acid, a third with potash, a fourth with nitrogen, and phosphorus, a fifth with nitrogen and potash, a sixth with potash and phosphorus and a seventh with all three combined. Then, if one plot is left unfertilized you should have a series of eight plots. If there is reason to believe that lime is wanted, it is a good plan to lay out your fertilized plots in long strips and run your lime across one end of your fertilized plots. This will give you all of the desired combinations and will enable you to determine whether

(Continued on page 22)

## Tests in Curbing Melon Pests

By H. A. CARDINELL and E. M. PAGE

University of Missouri College of Agriculture, Columbia



Operator in Missouri cantaloupe field dusting with hand machine against cucumber beetles.

**M**ELON growers have never in the past had a material that would satisfactorily control the striped and spotted cucumber beetles. The United States Department of Agriculture, Department Circular 154, gave the results of several years' trial with nicotine sulfate in a dust form that showed promise of being of unusual interest to growers confronted with these insects. A few melon and truck crop growers were able to obtain this dust in

time for trial in the summer of 1921. Only the 10 per cent strength of the 40 per cent nicotine sulfate dust was used by Missouri growers in whose fields our studies were made, because these beetles required this strength.

Applications of this dust every five to seven days, during the active beetle season, gave nearly perfect control and a minimum of beetle injury, while untreated fields,

(Continued on page 17)



# Factors Inducing Calyx Spray Injury

Query by Affected Grower: Answer by Plant Expert

*Here is detailed an unfortunate loss on apple crops of 1921, as reported by O. G. Rogers, of Looking Glass, Oregon. Mr. Rogers, from his study of the damage and curtailment of crop deduced that the cause was largely that of injury by the calyx spray of lime-sulfur and arsenate of lead. He built up strong evidence of this. Every apple grower finds the problem presented one of interest. Diagnosis of the case immediately follows Mr. Rogers's article.*

AT THE beginning of 1921, the fruit growers of our section, particularly the apple growers, had great hopes of a good fruit year. It was due.

There were plenty of large plump fruit spurs and the trees were in healthy vigorous condition. Except for the danger of frost all that was necessary to realize our hopes was successfully to combat the insects and fungus diseases.

The above condition particularly applies to us and our orchard of Winter Banana, Spitzenberg and Newtown apples. The trees are ten-year-old and everything was as hoped for until after the calyx spray was applied. In this spray was used the same strength of lime, sulfur and arsenate of lead as in former years: that is, 1 to 40 pounds lime and sulfur, plus 3 to 200 arsenate of lead.

Although we had never had scab in other years but, because of so much being at stake, I made particular effort to wet the leaves as well as the calyx end of apple. About one week after applying this spray I noticed the leaves from some of the last trees sprayed were falling.

I supposed then that the last tank sprayed out was made too strong of lime and sulfur, but a few days later the falling of the leaves was fairly general throughout the orchard. This defoliating of the trees kept up until after the 30-day spray.

My neighbors and the experts who visited the orchard were not willing to concede that damage was due to spray, but thought it caused by winter injury. However, I was convinced that spray was largely at fault because some few trees that were skipped showed no such condition.

Coincident with all this, the semi-nakedness of the trees, causing a devitalized condition, seemed to throw the doors open to the scab, for scab was invariably worse where the foliage had fallen the most. On such trees the scab ran as high as 90 per centimeter, and from that down to 50 per centimeter, while on the trees that were skipped scarcely any was apparent.

The temperature at the time of spraying was about 70 to 75 degrees, unusually warm for so early in April. No doubt this caused the lime and sulfur to burn the leaves. Winter injury might, in a limited way, have been a factor.

However, there was no need of crying over spilt milk. The damage was done, the question was how to salvage the most from the wreck. Thinning and good cultivation were the only things left to do. So we thinned, thinned again and, in part, the third time, always taking the apple that showed enough scab to make it a cull or even "C" grade so that, in many cases, a limb which could easily carry a dozen apples had only two or three. In the orchard as a whole there was probably 60 per cent of what would have been left under normal conditions.

The result was we had less apples thrown into culls because of scab than for sun scald or other defects and they were larger than apples of the same variety grown in this community.

My conclusion from this experience is that the college should furnish us a table of temperatures to guide us in applying these sprays that are liable to burn the foliage.

I learn now that many growers use 1 to 50 solution of lime and sulfur for the calyx spray and 1 to 60 in the 30-day spray. I learn also that others nearby who used the same strength as I did and sprayed on the same day had practically the same results.

It is possible the type of nozzle used and the power of the machine make a difference and that one could regulate the strength of the solution according to the kind of work the spray outfit is capable of doing. At any rate, we never had any such trouble when using our old machine, which was not capable of doing thorough work.

*The deduction of Mr. Rogers on the question of injury by the calyx spray was submitted for expert analysis, to Professor H. P. Barss, pathologist of Oregon Agricultural College Experiment Station. What follows is his statement on the subject. His analysis has very practical application, for it not only shows how such spray injury may come about, but proceeds then to suggest the underlying causes which may be eliminated, at least in most instances.*

by Mr. Rogers of Looking Glass. The injury took the form of leaf burn and leaf drop and was frequently followed by severe dropping of fruit. In some instances this injury took place after the "pink" or pre-blossom spray, but for the most part, the principal damage resulted after the calyx spray had been applied.

Many growers believed that possibly the lime sulfur was used too strong, but in view of the fact that ordinary dilutions were used in practically all these cases, dilutions that in other years have given very little if any injury, we must look to other causes than strength of spray to explain the situation.

In the first place attention must be called to the fact that apple trees vary a great deal in the matter of susceptibility to spray injury with lime sulfur, depending upon the condition of vigor and upon the weather conditions which prevail. Observations show that orchards planted in fertile soil or in soil where the fertility has been maintained by the efforts of the grower and where proper cultivation has resulted in healthy root conditions from season to season have proved not as subject to serious spray injury as orchards in poor soil, or in soil which has not been cultivated enough to conserve sufficient moisture through the season. The reason lies in the effects on the vigor of the trees.

Where trees are grown on land that is likely to be water-logged in early spring, or on soil that dries out before the end of the growing season the health of the root system is impaired and the leaves on such trees are more than ordinarily subject to spray injury. Vigor of root system and consequent vigor of foliage is greatly promoted by the very early start in spring cultivation practiced by an increasing number of growers each year.

Experiment station tests disclose the fact that plowing before the trees come out in the spring tends to bring about a healthy root condition because of the good soil aeration permitted by this practice at the very outset of the season. Furthermore, early plowing is of great advantage in scab control since the old leaves which carry scab through the winter and pass it on to the new growth in the spring are, to a considerable extent, covered up so they can no longer discharge their disease-producing spores in the orchard.

The relation of proper cultivation and care to spray injury was well illustrated in an apple planting last season where the trees were all of the same age and variety, but where one part of the planting had been poorly cultivated the previous year and had not been given the proper early spring cul-

(Continued on page 24)

OBSERVATIONS made by the Oregon Experiment Station last year showed serious spray injury to apple trees in many Western Oregon orchards such as reported



# Pear Culture in Western Washington

By ELMER HARMELING

Vashon, Washington

THE FIRST and all important question regarding pear culture is, "What soil and location is best adapted to get best results from pear trees?" The best soil for pears is a loam or shot clay soil with depth of from two to three feet, well drained, either naturally or artificially, with a slightly rising location sloping to northeast. Pears are early bloomers and on this slope they will be somewhat retarded in blooming, being less liable to be caught by late frost.

Prepare the soil for your pear trees as you would for your garden. The best is none too good. If the ground is already fertile all that is necessary is a good deep plowing, discing and harrowing. If your land is new and has never had a good clover or other legume crop plowed in, do not plant pear trees, unless you have plenty of barnyard manure, until you have plowed under at least one good crop of clover or vetch.

It is very discouraging to plant trees on new unfertilized ground and watch them stand there for two or three years and make practically no new growth. Wait until the soil is in good fertile condition and you will be far ahead in the long run.

In most of the coast country one can plant almost any time the trees are dormant, from the first of November to the first of April. Fall planting is advisable, for you usually have more time to give to the work and the roots have plenty of time to establish themselves and form the callous at the ends, from which the new roots start. Do not plant in a hurry. A little care and extra labor in planting will bring good returns on the investment. Dig the holes large enough for all the root system and then dig them a foot larger all around and a half a foot deeper. Put the top soil on one side of the hole and when you cover the roots use that soil first.

You will get wonderful results by putting in one or two pounds of bone dust mixed with the top soil, when planting. This gives the tree the vigorous start so necessary to make a good growth the first season. Make a smooth cut on all the main roots before planting and remove all broken parts of roots.

For most varieties of pears a distance of 20x20 feet will give very satisfactory results. For commercial planting use one-year whips, grafted on either the French or Japan seedlings, preferably the French, as the root system on the French pear seedlings seems to be better adapted to our soils. After planting cut back to eighteen inches from the ground as a low head will give better results and be easier to manage than the high-headed tree.

After you have your orchard planted,

*While this article on successful growing of pears was written by Mr. Harmeling primarily for growers affiliated with the Western Washington Horticultural Association, most of his instructions and suggestions apply in any district where pears may be grown. His pointers on varieties, planting, spraying and fertilization may well be studied by every grower interested in pears. The article is especially to be approved for its condemnation of slipshod, haphazard practices. There is little place in the fruit industry, the writer points out, for the man who picks and sells his crop and then thinks to "go to sleep until next season's crop hangs on the trees."*

seed the ground to oats for three or four years. The trees should be in bearing by this time, so all you will have to do when the pears are ripe is to pick 'em, sell 'em and go to sleep until next season's crop has matured. At least that is the method followed by too many would-be orchardists. If you can't take proper care of your orchard after it is planted, for pity's sake don't plant.

A very successful method for the care of the young orchard is to intercrop it the first three or four years. Strawberries planted between the rows have proven very successful, as this gives the trees absolutely necessary cultivation while they are young. After the berries are out you can safely seed the ground to clover or vetch which would be plowed under when mature. By plowing under a clover crop every other year, or a vetch crop every year, the trees will have enough fertilizer to produce and mature a good crop. Use commercial fertilizer if it seems necessary, but by the constant use of legume cover crops the trees will ripen all the fruit they should hold.

By seeding spring vetch about the first of October, it is ready to plow under about June 1 to 15 while there is still plenty of moisture in the soil. After plowing, disc every two or three weeks, the more the better. Seed again in October and repeat. This plan will bring results that will again pay well. I have found that whenever a good legume crop, especially red clover, is turned under any subsequent crop will grow and bear well.

WHAT varieties of pears are best adapted to the Puget Sound district? Practically any variety of pears will grow and bear in such natural pear districts, but

before making a selection of varieties it is a good plan to study local markets. Plant what the public will buy. Do not plant too many varieties. It is much easier to market 100 boxes of one variety than 100 boxes of ten varieties. Confine yourself to not more than four or five varieties.

As long as canneries operate the summer Bartlett will be in demand. While the cannery prices for Bartletts are not high the Bartlett is a sure bearer and, for commercial planting, it should figure largely in the pear orchard.

My next selection, I think, would be the Comice. The trees make a good upright growth, are good annual bearers and when picked and ripened properly are a delicious pear, always in demand. The Beurre Bosc will stand a good chance of coming next in line. The trees are vigorous, somewhat straggly in growth and good bearers. This pear is free from scab and other pests and of the finest flavor and color, the dark brown skin making it a pear that finds a ready market.

Should the Beurre de Anjou come next? While the finest in quality the Anjou is a shy bearer, the trees not coming into full bearing until ten or twelve years old and then, as a rule, bearing every other year. If I had a piece of good ground sloping to the north I would plant the Anjou. I feel sure that the reason so many do not have success with the Anjou lies here. They bloom so very early that if not caught by frost it is usually raining and cloudy during their blooming period and the blossoms are not pollinated. By planting then on the northern slope they will be retarded at least a week or ten days and the prospects for a crop are then good. The finest crop of Anjous I have ever seen was produced last year on eight-year-old trees planted on a northern slope. Practically all other Anjou crops were a failure.

There is room for prolonged discussion on what varieties to plant so let's not plant too many.

Prune the trees each year and every year. Start with a low head and not more than five branches. This gives the tree a strong frame-work. Do not be in a hurry to get the trees way up in the air, but cut back each year, leaving 12 to 18 inches of the current year's growth. Prune so the trees grow upward and outward leaving an open center. Each variety of pear tree has a different way of growing, some, like the Bartlett, with its stiff upright growth, and some like the Winter Nelis with its sprawling crooked limbs.

It is well, if possible, to have an expert prune the trees the first three or four years to give them the necessary frame and shape.

(Continued on page 19)



# Effects of Miscible Oil Sprays

By C. C. VINCENT,

Horticulturist University of Idaho, Moscow

*Probably no article BETTER FRUIT has published in several months attracted more comment and attention than that in the March number by J. R. Parker, summarizing a series of tests in Montana with various miscible oil sprays. Because it throws additional light on the subject this paper by Professor Vincent is presented at this time. It is hardly to be denied that certain elements of danger attend the application of these sprays. The sooner orchardists learn the what and when of those dangers the better it will be for both the makers and users. The practical value of the oil sprays has been widely established. There is no deprecation of this value in presenting the dangers the Idaho horticulturist seems here to have disclosed.*

EVER since introduction of the San Jose Scale into the United States it has been one of the most formidable insects that the fruit grower has ever encountered.

Control of the scale is still a serious problem. Its introduction in our state, however, has taught the fruit growers many valuable lessons. The most progressive growers soon learned the value of spraying and they were ever on the alert for better spray mixtures, better machinery and more effective methods of control.

The lime-sulfur solution therefore became the standard spray for the control of the scale and it was not long until practically all of the growers were using either the commercial solutions or home-made concentrates. In 1919, however, for some unknown reason these solutions failed satisfactorily to control the scale, the growers in many cases sustaining a loss of from 25 to 50 per cent of their fruit.

Various reasons were assigned for the tremendous loss, the principal one advanced by the growers being the poor quality of the lime-sulfur. Professor A. L. Melander, entomologist of the Washington State College, believes that certain strains of the insect have developed more or less resistance to the action of lime-sulfur. He has also found that oil sprays are more destructive than lime-sulfur and recommends them in those districts where the lime-sulfur failed to give satisfaction.

In our own experiments, which were conducted in the Lewiston valley, covering a period of three years, we found that the miscible oil sprays give slightly better results than the lime-sulfur, the efficiency

ranging from 94 to 99 per cent. These applications were made in early spring, just as the buds were beginning to swell.

WHAT ARE MISCIBLE OIL SPRAYS?—Miscible oils may be defined as emulsions or preparation of oils readily mixing with water. According to a recent government bulletin, "they are composed chiefly of a mineral oil emulsified with a soap usually made from a vegetable oil and an alkali. In a miscible oil the mineral oil is subdivided into many minute globules and, when mixed with water, the oil is evenly distributed throughout the water. The safe use of the miscible oils is thought to be largely dependent upon the relative fineness of these particles."

To prevent recurrence of the 1919 loss, the growers decided to use a miscible oil spray as a clean-up spray in their orchards. The general plan was to make the application in the fall, followed by the regular lime-sulfur solution in the spring. This plan was generally accepted in view of the fact that experiment station men have from time to time recommended two applications, one in the fall after the leaves had fallen, and the other in the spring as the buds were swelling. However, owing to the rush of work the majority of the growers failed to make the full application.

EXPERIMENT CONDUCTED—One grower, however, started two spraying crews on November 25, 1919, in a block of Baldwin trees using the insecticide at the rate of

one gallon of the oil to fifteen gallons of water. This block of trees had been planted during the late winter of 1910-11, directly along the bank of the Clearwater river, on rather poorer soil than most of the balance of the orchard.

The trees, however, had made a good growth each year, and at the time of spraying were in a good physical condition. This block of Baldwin trees were selected for the experiment in view of the fact that a heavier infestation of scale was noticed on the fruit at harvesting time, than in other parts of the orchard.

The manager of the orchard had instructed his foreman to spray in eight or ten rows from the river, and in order to do so, the river curving outward, he jogged in and out from row to row in a very clearly defined pattern. Therefore the area covered was very easily distinguished by the appearance of the trees after spraying. The two outfits worked the entire day, spraying in all, over 600 Baldwin trees.

CLIMATIC CONDITIONS—The weather bureau reported for the day a maximum temperature of 40 degrees and a minimum temperature during the night of 29 degrees. The weather turned cold the next day so spraying operations were discontinued. This was followed by a heavy snow storm.

(Continued on page 27)



Northern Idaho orchard where late fall application of miscible oil spray, followed by severe cold weather, produced much damage. Unsprayed trees are shown in background.



## Merits of the Black Raspberry

By W. S. BROWN

*Chief in Horticulture, Oregon Agricultural College, Corvallis*

AS YET the growing of the black raspberry is confined to comparatively few sections, but is undoubtedly worthy of more attention. It makes a splendid product for the table in any one of several different ways: the fresh berries are fine either for sauce or pies, the black raspberry when properly canned, is one of the richest and finest flavored sauces that can be obtained from fruits. It lends itself especially to the making of excellent jams, and dries to the best advantage of any of the small fruits, drying out from 20 to 25 per cent of its fresh weight.

The blackcap is easily cared for and requires less hand labor than many of the other small fruits. On the whole, this industry should be encouraged by being more widely advertised. When the merits of the black raspberry begin to be known to the average housewife in Oregon, prices of this delicate and delicious fruit will increase. The statement is often seen in literature bearing upon bramble fruits, that the black raspberry does not produce as well on the Pacific coast as does the red raspberry.

This is true, as a general rule, but when careful selection is made of soil and slope, coupled with good cultivation, careful pruning and protection against pests and enemies, and when in addition, the fertility of the soil is carefully maintained the blackcap will regularly outyield the red raspberry. In the east the black raspberry is regularly counted upon to outyield the red raspberry.

In a state which has been growing small fruits successfully for so many years we are safe in recommending four or five leading varieties that have proved themselves especially good. From time to time, many varieties are brought forward, some of which have considerable merit, others of which will not do well under our conditions. The best thing for the grower to do is to try a few of these many varieties as a local experiment on his own place, and couple with the information he obtains any further advice he may get from the state experiment station or from other growers who may have grown and tried out the variety in question.

Varities recommended are as follows:

### EARLY TO MID-SEASON

Plum Farmer—Vigorous, healthy and productive.

Munger—Moderately vigorous, productive.

Cumberland—Strong grower, healthy and productive.

### LATE VARIETIES

Gregg—Vigorous and productive, but somewhat tender to cold, and somewhat crumbly for a canning variety.

Of the four varieties mentioned the Plum Farmer and Munger are the leaders in some sections of the state, while the older varieties, Gregg and Cumberland, lead in other sections.

Purple canes are crosses between the red and black raspberry. The best of the purple canes are undoubtedly the Columbia and Schaffer. The growing of purple canes should be encouraged in some sections, especially those near large fresh fruit markets.

The black raspberry requires a deep, rich, cool, moist soil, very well drained. When sufficient water can be added by irrigation, the black raspberry will do its best on sandy loam soils. Under Willamette valley conditions, however, the plant does best on a light friable clay loam that is fairly retentive of moisture. Under no conditions should the black raspberries be planted on poorly drained tight clay loams. They will soon die out and will be unprofitable from the start.

The slope should be to the north, preferably, because the black raspberry should be kept from being shriveled up from the heat of summer and becoming too seedy. The north slope is cooler and can be kept more moist. In some sections north slopes have deeper soils than do south slopes. Good air drainage is necessary also to protect the plants against winter killing, and to avoid damage from late spring frosts.

THE MORE humus the soil contains the greater will be its water-holding capacity. There is nothing that fills the bill better in this respect than stable manure containing more or less straw. The cover crops make a very good substitute for stable manure, especially if a leguminous crop is grown. Oats and vetch sown together in proportions of 30 pounds of vetch to 20 pounds of oats, and then plowed under as soon as plowing season arrives in the spring makes a very satisfactory cover crop.

In western Oregon careful and frequent cultivation must be resorted to if the moisture content of the soil is to be conserved. This means a frequent shallow cultivation rather than deep cultivation, because the roots of the plants are relatively shallow, and if the cultivating tools are set deeply more harm may result by cutting off roots than good may be accomplished by the cultivation. Most commercial plantings are set 4x8 feet so as to permit thorough work either with horses or tractors.

It is coming to be generally understood by the growers of all kinds of small fruits that if the soil is not rich enough for the fruit they must supplement the fertility of the soils in one form or another if they are to get maximum results.

The best treatment for the berry patch is to give it a liberal dressing of stable manure the year before planting. If 10 to 12 tons of manure to the acre can be worked into the soil throughout the fall preceding planting in the spring, the growth of the vines is usually such that by the second year there is quite a crop upon them, whereas, if the vines are not fertilized, it is usually the third season before they produce berries sufficient to pay for harvesting.

In case stable manure is not obtainable, commercial fertilizers combined with green manures are often profitable. It is a fact that the nitrogen content wears out fastest in the soil. Hence, the job of the fruit grower is to build up the nitrogen content so that he will get a well balanced ration of nitrogen, potash and phosphoric acid. He will know when this is accomplished by the vigorous appearance of the leaves and shoots. As a rule, we have enough phosphoric acid and potash to provide for ordinary yields, but if maximum yields are produced, they can only be brought about by increasing the nitrogen, phosphoric acid and potash in a sort of balanced ration in the soil.

In other words, it will do you little good to increase the nitrogen application beyond a certain point, unless the plant also has enough phosphoric acid and potash to build into its tissues, to balance the nitrogen. The berry fertilizers put out by fertilizer companies are usually good when maximum production is wanted. If one chooses to make up fertilizer, he can do so by using a formula of 4 per cent nitrogen, 8 per cent phosphoric acid and 2 per cent potash.

## Tent Caterpillars

TENT caterpillars may be present in unusual numbers the coming season, according to the entomologists at the Oregon Experiment station, who have been making field observations. Gathering the egg masses and burning the nests with a torch are still the most satisfactory methods of control for this serious insect pest.

Egg sprays have not been practical as a rule and while lead arsenate at the rate of 3 pounds to 100 gallons is effective against the newly hatched worms, these are not usually noticed until they are partially grown when spray even twice that strength kills but slowly.

Tent caterpillar eggs occur as small compact rings on twigs and can be easily cut out without damage to the tree. These egg masses may be destroyed, but a better plan is to place them in a barrel or other container over which a screen is tacked. High parasitism exists in the eggs and these parasites are an important factor in control. They escape through a screen when the eggs hatch and attack caterpillars left in the trees. Burning the nests with torches should be done after dusk.



In the passing of David S. Lake, president of the Shenandoah Nurseries, whose death occurred in February, this country lost a horticultural leader of remarkable ability and achievement. Dying at the age of 74, he had for 52 years been in the nursery business, most of the time at Shen-

andoah, Iowa. Through indomitable energy and integrity he built up this business until it became the chief industry of his city, known wherever nursery stock is sold.

In order to spur interest in the annual Land Products Show to be held in Port-

land next fall, advance premium lists have already been prepared and sent out.

*I am renewing for three years more of BETTER FRUIT. Would be lonesome without it.—Ralph Burdick, White Salmon, Wash.*



## Some Practical Notions About Buying Farm Machines

THE growing season is well under way, six million farmers are out in the open, remodeling the great fertile world, and **you** are probably confining your attentions to the fields out of which your own profit must come.

Ahead of you is a summer of activity, and your plans will have much to do with farm machines. This summer you may invest in a number of such items of practical equipment as are listed at the right. You will be deciding what machines will increase your production, save you the most, and cost you least in the long run. Each purchase will lay a bit of the foundation for coming seasons.

Each new machine must be a good, reliable worker and moneymaker for you during years to come. It has been proved many times that one defective, inefficient machine may in one season tear down the profits built up by good tools and hard labor. Your choice in each case is no light matter for there are wide variations in value.

It is not for selfish reasons alone that we ask you to consult with the McCormick-Deering dealer in filling your farm equipment needs. The plainest sort of common sense, a long unbroken record of accomplishment, the ripe judgment of millions of good farmers—all considerations point to the same advice:

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## Pruning and Training of Grapes

By R. T. REID

Bellevue, Washington

COMMERCIAL grape culture in the United States received a tremendous impetus upon introduction of the Concord about the year 1853. This continues to be the leading variety of the American grape (*Vitus Labrusca*) grown in the United States.

Prior to 1853 a few vineyards of native grapes and hybrids of the American and European (*Vitus Vinefera*) had been planted, the fruit being grown principally for wine. Of these grapes the Catawba appears to have been in highest favor and still is considered one of the best varieties.

The methods of pruning and training in these early days were patterned after European methods and it was doubtless due largely to this that the growing of the grape commercially had been only partially successful.

A few years prior to the introduction of the Concord an accident occurred in a small vineyard in the Hudson River Valley owned by William Kniffin, a stone mason, by which one of his vines was badly broken, most of the old branches being stripped from the vine. It was thought the vine was ruined, but as the season progressed it was found that the fruit of this vine, which was borne on shoots from canes one-year-old, was of superior quality and the yield as good as that of vines that had sustained no injury.

Fortunately, Mr. Kniffin was a keen observer and, desiring to prove the correctness of his guess as to the cause of the phenomena, pruned other vines next year in much the same way the injured vine had been pruned by a falling tree, with equally gratifying results.

These experiments resulted in establishment of the American high renewal system, popularly called the Kniffin system. This, with modifications to suit the personal preferences of individual growers, or the habits of certain varieties, may be said to

have become the standard system wherever American grapes are grown.

Pruning and training are terms which are frequently confounded when speaking of the grape, but in reality, represent distinct operations. By pruning we mean the removal of certain of the branches, with the object of obtaining a larger quantity and better quality of fruit from those remaining. Training refers to the disposition of the different parts of the vine.

It is true that different methods of training demand different styles of pruning, but the modification is only such as adapts a particular system to the external shape and size of the vine and does not in any way affect the principle upon which it rests. Pruning is a necessity and, in essence, there is but one method. Training is a convenience, and there are as many modes as there are fancies among grape growers.

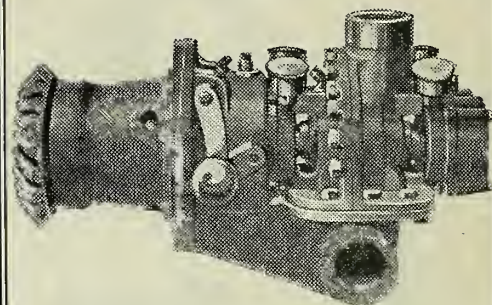
All intelligent pruning of the grape rests upon the fact that the fruit is borne in a few clusters, usually two or three, near the base of the growing shoots of the current year, which spring from wood of last year's growth. Unless this fact is borne in mind and a system of pruning adopted that will be in harmony with it, the grower is sure to be disappointed in the quality of the fruit and, to a greater or lesser extent, in the quantity produced.

Since most of us are engaged in the business of horticulture for profit and not alone for the pleasure it affords, it is important that we select a method of pruning that will produce satisfactory results, with the minimum cost of time and labor in training. In other words, a system is needed that renders training practically unnecessary.

IN A STUDY of the grape it is important to know the names by which the various parts of the vine are known; namely, the trunk, the branches, the cane, the spur and the shoot. The shoot is the leafy branch

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of the current season's growth that bears the fruit. The cane is a shoot in its second year, from which bearing shoots of the current year spring. The branch is a cane more than one year old. The spur is a cane cut back to a short stub, usually having but a single bud, while the trunk is the permanent part of the vine leading directly from the root.

The principal objects sought in pruning the grape are: Free circulation of air; admission of light into the interior of the vine; provision of shade for the growing fruit, that it may not be scorched by the direct rays of the sun; protection of the fruit from rain and frost by foliage; admission of the sun's rays to the soil upon which the vine is growing, and the limitation of size of the vine to its allotted space.

The four-cane Kniffin, high renewal system of pruning is recommended as best suited to the varieties found adapted to the soil and climate of our western Pacific slope. This consists simply in selecting two or four shoots that spring from the canes near the trunk for the canes of the next season, and cutting all other growth away.

Two of these shoots are then tied loosely to the top wire of the trellis and two to the second wire, being cut back at the time to from five to ten buds each. The shoots for the second wire would naturally be selected at a point on the vine below those intended for training to the top wire. If the vine is not strong only two shoots may be retained and the number of new shoots limited by cutting them back to a lesser number of buds.

To restrict spread of the vine, spurs may be made of shoots springing from the trunk and the shoots that spring from these are then selected for canes the following year. As all of the shoots are at a height of from three to five feet from the ground there is little need of training the new shoots which have a tendency to grow downward, due to the weight of foliage and fruit.

If it is found that such shoots interfere with cultivation during the latter part of the season, the ends may be cut off or they may be pushed back under the trellis and held in place by short stakes. All shoots that spring from the trunk and those that come up from the root should be broken off when only a few inches long, as they rarely bear fruit and tend to sap the vitality of the vine.

## Date Prune Plantings

SINCE last fall approximately 100,000 date prune trees have been planted, according to a report from the Oregon Nursery Company, which holds exclusive propagation rights. The company officials have been highly gratified by the reception the new sweet prune has won for itself.

One of the late shipments of the Coates, or date prune trees, comprised a carload sent to southern Idaho for planting there. The nursery company is setting out 80 acres

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of the trees in the vicinity of its headquarters at Orenco. Even more extensive plantings are expected next season as scores of interested land owners who were unable to complete preparations for setting out an acreage this season will do so in the coming year.

The company reports that there has been excellent demand for all sorts of trees with "all lines cleaning up very satisfactorily." The demand in some lines has, in fact, exceeded the supply.

The special gift boxes of prunes put out by the Washington growers last season met with great favor and many repeat orders have been received.

**THE FIRST** few hours of a baby chick's life it is very sleepy. It has been through a severe strain getting out of the shell and it needs a rest.

## VALUABLE TO TEACHERS

Massachusetts Agricultural College,  
Department of Education  
Amherst, Mass., Feb 4, 1922.

BETTER FRUIT,  
Portland, Oregon

DEAR SIR: Our copies of BETTER FRUIT are placed on the tables of our teacher training study room for careful examination and discussion, in order that when these teachers in training go out into real work they may make wise selections for the boys whom they teach in the agricultural departments and special schools.

Very truly yours,

W. S. WELLES  
Professor in Vocational  
Agricultural Teaching



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VOL. XVI, NO. 11

## New Development Plan

An inspiration of leaders in Wasco county, Oregon, has led them to form a new development body that will work from a new angle. Details of the proposal are sketched in other columns of this issue.

The plan involves co-operation of city and country interests in maintaining what is known as the Agriculture and Horticulture Bureau. As manager of this bureau, has been selected an expert whose chief duty is to be that of advising land owners on the planting of new acreages. In this way there is to be concentration not only on the proper sorts of fruit, but on the best adapted varieties as well.

Advantages of this plan of organized and co-ordinated plantings are so obvious as to need no emphasis. The plan solves a lot of the problems pertaining to production and marketing of berries, fruits and vegetables. For such reason alone it is worth no little effort and expense and a lot of patience.

The bureau plans no blatant boosting of the district through fancy pamphlets or red-ink advertising. That more settlers are wanted and can be accommodated, the bureau promoters admit. To these, of course, is promised opportunity for profitably engaging in the production of fruits and kindred crops. But the mission of the bureau is conceived to be that of co-operating with the settler to the end that he may be successful, rather than that of luring a large number to chance success with unguided efforts.

Operation of the plan is already proving a stimulus to development. Ranchers of the district, backed by expert guidance and assured of improved marketing facilities, are clearing and planting new acreages. If the bureau but survives and "carries on," the district seems assured of more rapid development and greater prosperity.

The Wasco idea may well be watched and—if but reasonably successful—copied by other districts.

## Cold Storage Needs

Portland very much needs a cold storage unit in connection with its port facilities. Obviously, we take no pride in giving publicity to this fact. It is cited in the hope that all interests concerned may become fully alive to the need; that, for the good of thousands of fruit growers in tributary territory, the need may be filled.

As every reader knows, the past season witnessed a remarkable increase in water shipments of fruits of the Pacific Northwest. We think every reader, sizing up this development as we do, feels sure the transportation of our fruit over water routes will become more and more extensive.

It is to be hoped then, that every reasonable facility that will aid in this more economical distribution of fruit products may be provided. Practically all port bodies of California and our two northwestern states have provided cold storage

facilities as a part of their equipment.

By those who have made the surveys and attacked the problem for the Columbia Basin district, it is said the Portland Dock Commission originally stated that it had funds and stood ready to provide adequate cold storage units if the need were shown. Now, it appears, the need seems pretty clearly proven, but the commission is said to report a lack of funds for the purpose.

Fruit men are more than a little concerned over the situation, as seems only natural under the circumstances.

## Apples \$1 Apiece

A Chicagoan, traveling in Turkey, discovered that his hotel in Constantinople had a box of Oregon Delicious apples. On ordering one for breakfast he found them "so delicious" that he repeated the order each morning during his stay at the hotel.

When the traveler came to pay his bill he found that he had been charged 24 piasters per apple, or virtually \$1 apiece

The Chicagoan might well lay claim to having paid the highest price on record for Oregon apples. Instead of making this boast, however, here is what he wrote a friend in relating the experience:

"I was perfectly satisfied, as they were about the best thing I tasted on that trip."

Most assuredly a testimonial worth framing!

## Poor Economy

Hood River County has lost a capable and valued fruit inspector because the commissioners thought it necessary to cut the salary from \$3100 to \$2400 a year. It may so happen that no serious consequences will result. The commissioners may be fortunate in finding a man of integrity and experience at the lower salary. Most of the growers of the county seem to think the infinitesimal saving on their taxes may be lost through less efficient inspection service.



## Berries for Canning

By J. O. HOLT

Manager Eugene Fruit Growers' Association

THE northwest has become the berry patch of the United States, and the Willamette Valley seems to be a favored center of that berry patch. It is fit for all kinds of berries. We have a good berry country around Eugene, but it is limited as regards red raspberries.

We want nothing but the Cuthbert red raspberry for canning. It has a habit of growing singly and sometimes does not produce as much as the others. I like to grow blackcaps because I can pick them by the handful. We have some that used to bear very well—Shaffer and Columbian. They were on strong clay soils, but might be a better bearer. Don't go into them strongly on a canning proposition.

As to the blackcaps, I think the varieties named are good for canning purposes with the exception of the Gregg. The Gregg crumbles under various conditions and makes a poor looking product. The Kansas, the Plum Farmer, which in my opinion is a Kansas, is a good berry, and the first year or two I found the Cumberland an excellent berry, but they become small and have no bloom. It makes a beautiful berry. The Munger is all right from the canning standpoint.

We raise only a few red raspberries in our country. In 1910 we had only 7000 pounds. In ten years they have increased to 108,000 pounds. I presume they have increased in other sections of the country in about the same proportion. In ten years the cannery price has increased from four cents to eight and one-half cents last season.

Our logans have increased in ten years from 15 tons to 340, and the price in 1911 was three cents and last year it was five cents. The evergreen blackberry has had

a constant growth with us. We began canning in 1911, paying two and one-half cents; this last year we canned 614 tons—one and a quarter million pounds and paid five and one-half cents.

The number of berries going into barrels is increasing, and would increase more rapidly if people knew more about how to handle them and had the facilities to do so. Berries to be put in barrels should be put in the same day they are brought in and put right into the freezer.

As we go on, we are using less sugar and putting more barrels into storage, without sugar at all in them. Simply putting the berries in, filling them within four or five inches of the head, heading them up and

freezing them immediately. This is one of the cheapest ways of handling them.

## Overhaul Prune Drier

Now is the time to get the prune drier in shape for next year's run. All of them need cleaning up before using again and most driers will be benefited by increasing the circulation through allowing more air in the furnace chamber. Holes one foot square and at one-foot intervals around the entire base of the drier will create more rapid drying. The throat of the furnace chamber leading the the tunnels should be widened so that a hole at least four feet in width is obtained.

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FRUIT CAN FRUIT BOX  
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EVAPORATED FRUIT  
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CARTONS

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HAY UNLOADING TOOLS



A GOOD Hay or Grain Unloading Outfit saves the cost of one to three men each day of harvest. Myers Hay Tools have been THE STANDARD FOR 50 YEARS. Sturdy construction, patented features, low price, make them the biggest-value made. Also a complete line of Pumps and Door Hangers. See your dealer or write us for booklets. (16)

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## New Potato Bulletin

"Potato Diseases in Oregon and Their Control," is the name of a 52 page bulletin, just off the press and ready for free distribution. This bulletin by M. B. McKay, associate plant pathologist at the Ore-

gon Experiment station, gives general control measures for all potato diseases common to Oregon with a discussion of each separate disease. This is a popular bulletin written in plain language.

TELL THE advertiser you read his ad in these columns.

Your paper is good. Keep up the good work and keep it coming to me.—Ross F. Mayer, Granger, Wash.

▲ ▲ ▲

You had some excellent publicity in the January issue for new settlers.—William Sutter, Kettle Falls, Wash.

# Economy

lowest cost per horse-power hour is record of

## CATERPILLAR

### T-35 TRACTOR



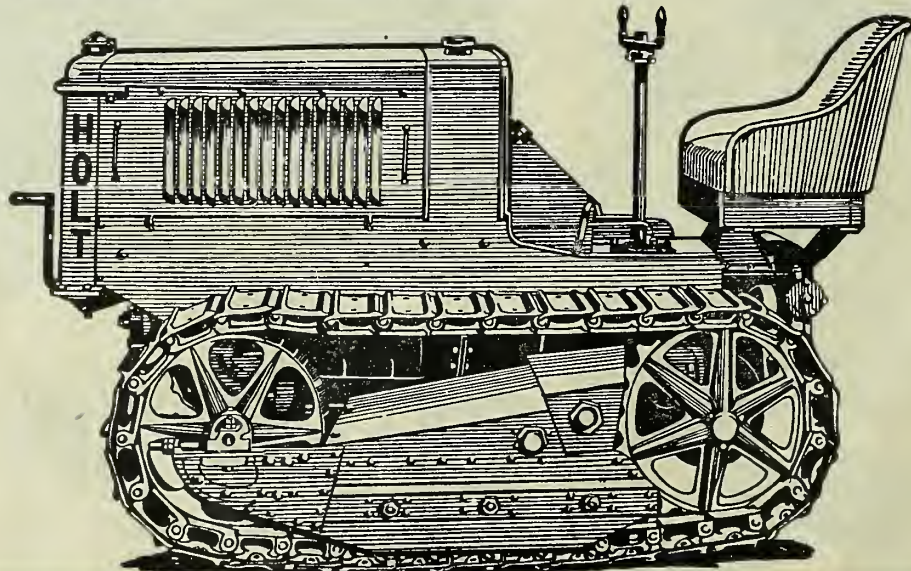
"Caterpillar" T-35 Tractor is not designed or built to meet a price. It is built to maintain the high and exacting standards of "Caterpillar" performance—dependable, economical, trouble-free service.

In the "Caterpillar" T-35 Tractor there is greater economy, greater value—by every test and measure—in dependability—in long life—in low operating costs—in negligible repairs—in capacity for work—in uninterrupted field service and in every other way. "Caterpillar" T-35 Tractor was not offered to the public until it could meet these value-tests.

This Tractor is ideal for small farms, vineyards, berry fields, road patrol work, hauling and general contracting. It also is a handy supplement to the power needs of big farms. Its utility as a tractive power unit is supplemented by its ability to handle scores of belt jobs: pumping, grinding, sawing and other stationary work. A factory and a service organization on the Pacific Coast assure service any time, anywhere. Write at once for full information.

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 Oregon Representative, J. W. Hill, Henry Building, Portland





## Walnut Pest

THE walnut-husk maggot (*Rhagoletis suavis* Loew), long known as a disagreeable inhabitant of the hulls of the native black walnut in its eastern range, has demonstrated its versatility by attacking in like manner the English or Persian walnut wherever grown in the East. Some of the infested nuts drop prematurely, whereas others hang to the trees.

The injury to English walnuts is three-fold since it impairs the quality of the kernels, causes the husk to stick to the shell and blackens and soils the shell, making the nuts unattractive for market.

Spraying with lead arsenate one and one-half pounds to 50 gallons of water resulted in only 4 per cent infestation at harvest time against 60 per cent unsprayed the previous year. Such treatment, however, cannot be recommended as a positive control as the flies succumb very slowly to the effects of this poison.

It is of interest to note that this pest is a close relative of the well known apple maggot, or railroad worm.

A preliminary report on this walnut pest, recently has been issued and may be had on application to the Federal Bureau of Entomology, Washington, D. C.

Loganberry growers of Lulu Island, near Vancouver, B. C., recently formed an association.

The government experiment station at Sitka, Alaska, is experimenting with new varieties of potatoes that may be adapted to conditions in Alaska.

Thinning  
Shears

Ladders

Picking Bags

The Hardie Mfg. Co.

55 N. Front St.,  
Portland, Ore.

## Tests in Curbing Melon Pests

(Continued from page 6)

or those receiving applications of three pounds of powdered arsenate of lead in 50 gallons of water applied with an engine power melon sprayer, were nearly destroyed. Several melon patches were dusted in comparison with the fields sprayed with power sprayers and in no case was this strength of liquid material able to control the beetles, which were unusually numerous last season. In every case the power sprayers were abandoned in favor of dust in order to save the fields.

The hold-over protective time was

greatly lengthened when 5 per cent of arsenate of calcium powder was mixed with a 10 per cent nicotine sulfate dust, since the nicotine dust is very volatile and appears to lose its killing power against these beetles after a very few seconds, under field conditions.

Since these nicotine sulfate dusts as reported by the government were not manufactured east of the Rocky Mountains

### POND PRODUCTS

(Nation-Wide Distribution)

Prop-hooks, Screw-eyes, "Centipede ladders," Thinning Shears, other horticultural devices. Circulars on request.

**Russell G. Pond**

Parkdale (Hood River) Oregon.

## The Importance of Proper Moisture Content in Boxes

**B**OXES made from seasoned lumber are many times stronger than boxes made from green lumber. They hold nails and they stand the test of storage.

A properly seasoned box means safety and protection for your fruit. An improperly seasoned box leads to loss from loosened nails and rough handling in shipping.

Exhaustive tests by the United States Government show that 12 to 15 per cent is the proper moisture content for box shooks. That is the standard of sturdy Westpine boxes. It is maintained by rigid inspection.

All lumber that goes into Westpine boxes is thoroughly air dried under the atmospheric conditions in actual service. Westpine boxes never require re-nailing.

To be sure your boxes have the proper moisture content which means strength, safety and protection buy tested and inspected Westpine boxes.

*Write today for further information*

Box Bureau, Western Pine Manufacturers' Association

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**WESTPINE  
WOODEN BOXES**





they could not be used extensively in the Mississippi valley. It was necessary, therefore, to recommend other materials to be universally used by the growers for the 1921 crop.

Although a 4 to 7 per cent strength of nicotine sulfate dust is ordinarily recommended for the control of melon aphid, only the 10 per cent strength was used since the beetles were the main problem. One of the outstanding advantages of using a nicotine sulfate dust against the cucumber beetles is that aphid will be controlled incidentally and save purchasing separate strengths, as some years aphid are not a factor. More aphid were killed with nicotine sulfate dust than when we used liquid nicotine sulfate soap solution in power outfits, using six-foot extension rods and angle nozzles.

**ARSENATE OF LEAD, PARIS GREEN, LIME FORMULA**—It was also found that a mixture of 1-pound dry arsenate of lead, one-half pound Paris Green mixed with 15 pounds of hydrated or air-slaked lime, when dusted upon the plants, gave almost perfect protection against the cucumber beetles when applied every five to seven days from the time the plants appeared until beetle feeding practically ceased.

**CALCIUM ARSENATE AND GYPSUM**—Several commercial growers used the Ohio recommendation: One pound calcium arsenate mixed with 20 pounds of gypsum. This mixture, when applied regularly, gave fairly good protection from beetle feeding, but severe burning resulted and therefore seemed not as practical as the other dusting mixtures which gave no burning.

A few growers used "Lazal," a branded product of the General Chemical Company, and our notes show that very satisfactory control was obtained against cucumber beetles. No burning resulted when

used at full strength, nor when 5 per cent was added to "Nico Dust."

**MELON ANTHRACNOSE**—In the almost total absence of liquid power sprayers in the Missouri melon territory several commercial growers were advised to apply a copper compound as a dust in a good hand operated bellows-type duster. Two materials were used: Dry Bordeaux ("Orchard Brand" the equivalent of 21.82 per cent metallic copper) and dehydrated copper sulfate (Niagara product). The time of application was the same as commonly recommended for liquid Bordeaux.

The copper dusts were applied in several counties and the results were very uniform. There are apparently few or no records where copper compounds have been used as a dust for controlling watermelon anthracnose nor of the tolerance of this type of plant to various forms and strengths of copper compounds.

Accurate records were kept for one field which contained 150 rows of watermelon plants set 10x10 feet with 32 hills to the row. Eight rows received but two applications of one pound dehydrated copper sulfate to each four pounds of lime, the regular second and fourth applications as recommended in United States Department of Agriculture, Department Circular 90. An average count of the eight rows at two pickings showed a total of twelve melons with an average of one lesion per melon. Nine rows were used as checks against the eight treated rows and a count at two pickings showed an average of 24 melons per row too badly diseased to make lesion counts.

**DRY BORDEAUX AND LIME**—Dry commercial Bordeaux manufactured for liquid spraying was used in various strengths and with different timing of applications. Two rows received for the first application equal parts of dry Bordeaux and hydrated

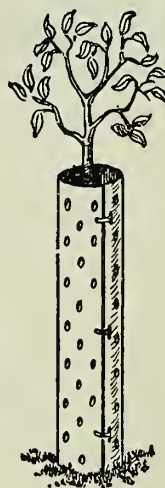
lime, the second application was the same and the third and fourth applications had one pound of dry Bordeaux to each one and one-half pounds hydrated lime. The two commercial pickings showed a count of only 7 melons per row which had any sign of the disease.

Four rows received Bordeaux and lime in which equal parts were used in the first application and one to one and one-half in the three other applications. By actual count an average of the two pickings gave nine melons per row showing slight lesions.

Five other rows received this material in the same strengths as the four rows previously mentioned, but the regular second application was omitted. The two pickings showed an average of 21 melons per row badly "blistered."

Eleven check rows used against the dry Bordeaux gave a count of 20 melons per row badly infected.

### TREE PROTECTORS

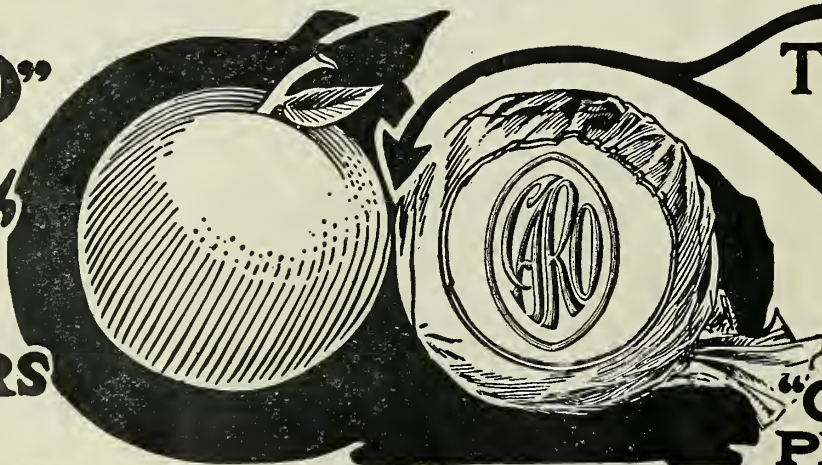


both Perforated and Non-Perforated, both for trees and vines. Why go to the expense of buying your land—grading it—buying your trees or vines—expense of planting same and then just leave them exposed for rabbits, squirrels, sand storms, sun scald, to destroy and injure a portion of them when we can help you to save every tree. We have sold over 15 million in California in the past few years, let us also help you to get a 100 per cent stand. We make a number of kinds. Tell us your pest and we will tell you what to use. Ask for samples if interested. We also make Propagating pots, for early vegetables.

The Expan Company  
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Follow the Violet Lines. There is Merit in the Wrapper.

**"CARO"**  
*fruit*  
**WRAPPERS**



This  
is the  
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**"CARO"**  
**PROTECTS**

**"Caro" Protects—"Caro" Prolongs the Life of Fruit—Why?**

CHEMICALLY TREATED WITH BORDEAUX MIXTURE

FRUIT MATURITY is retarded by cold or refrigeration and hastened by heat or atmospheric exposure.

The soft fibrous silk-like texture of "Caro" provides just sufficient ventilation to retard the ripening process.

FRUIT DECOMPOSITION starts from a bruise which opens tiny holes and permits juice to escape and BACTERIA to enter. "Caro" clings closely and dries up the escaping juice. "Caro" ingredients harden the spot, destroy BACTERIA and FUNGUS SPORES and arrest decomposition.

United States Distributors, AMERICAN SALES AGENCIES C O., 112 Market Street, San Francisco, California.



In all cases the last application was applied to the fruit only.

The results of the copper dusting encouraged the users of this cheap method and more applications will be used next year.

With us the system of tenant farming prohibits the use of expensive power liquid sprayers and for that reason much hope is placed on the success of a dusting method. It means one man with a \$25 duster as against two to five men with a three or four hundred dollar sprayer.

On the field of 150 rows from which one and one-half cars were loaded under the association rules, only 32 rows received insect protection throughout the season and nineteen of the 32 rows received copper dust. Over 80 per cent of the merchantable melons loaded from the 150 rows came from the 32 dusted rows and over 90 per cent of the large melons (over 35-pound average) came from these 32 rows.

From our notes it is apparent that the second application (one week after first melons have "set" on vines) is the "calyx spray" of the watermelon for when that was omitted any number of applications thereafter showed little signs of checking the disease.

## Pear Culture in Western Washington

(Continued from page 8)

After that the most essential thing is to prune them enough. Let the sun and air get at the fruit. Five boxes of choice fruit is much better than 100 boxes of culls.

The worst pest to contend with in the Sound country is the scab. For this, spray the trees when still dormant, about the first of March, with a regulation lime and sulfur solution, 1 to 8. This will kill all the spores left on the trees, also any scale that may be there. Spray again when the fruit is the size of small marbles with Bordeaux mixture, 4-4-50. Add one and one-half pounds of powdered or paste arsenate of lead to each 50 gallons. Spray to kill slugs and other chewing insects. Spray with the same solution in three weeks and again in three weeks. This should give you clean fruit unless the season is especially cloudy and damp. Scab thrives in mucky weather.

For the blister mite, or sometimes called the pear rust, use a lime sulfur spray, 1 to 12 or 15, and apply just before the buds open. At this time the eggs are hatching and the spray is most effective. This pest is hard to control in certain parts of the country out here, but does not seem at present very troublesome. Have you ever observed the rusty leaves of the mountain ash? It seems that possibly this mountain ash is the host of the blister mite. Maybe, if we destroyed all the mountain ash we would have no more trouble with this mite,



**Horse drawn**  
—  
**Tractor drawn**  
—  
**High Pressure**  
—  
**Five Sizes**

# "Friend" Sprayers

*Distributed in the Northwest by*

**Hood River Spray Company**

**Hood River, Oregon**



<b>Musical Merchandise</b> — <b>Write Us</b>	<b>WE SAVE YOU MONEY!</b> <b>W. Martius Music House, Inc.</b> 1009 First Avenue, Seattle, Washington Everything Known in Music	<b>SHEET MUSIC</b> — <b>Write Us</b>
--	---	--

but unless it becomes more troublesome let us keep our beautiful mountain ash.

Black-spot sometimes works on young pear trees when they are in a weakened condition or bruised with a single-tree. The bark turns a dark brown color and loosens from the tree. Make a solution of Bordeaux, 8-8-50, and with a brush paint the trunks and main branches thoroughly with this mixture.

**P**ICK the pears when the seeds have turned from a white to a dark brown and when the stem breaks off the twig or peduncle readily. Don't let the fruit ripen on the tree. If the picker is not careful, many of the fruit buds, being already formed for next season's crop, will be broken off and the crop shortened for next

season. All the fruits should not be picked in one operation, as it seldom happens that all the fruit is equally developed. There is generally a difference of a week and sometimes two weeks in the time of the maturity on the same tree. Go over the trees two or three times. With a little practice you can readily tell which pears are ready to be picked. Always pick with the stems on. Handle the fruit very carefully as a bruised pear will soon rot, but not ripen.

If kept for future use or sale take them as soon as picked to the storehouse and keep them at a dry temperature of about 15 degrees above freezing until ready for market. Keep the light entirely excluded from all storage fruit. On this precaution depend the flavor, color and texture.



Most of the small pear growers have no storage room and must sell the fruit as soon as harvested, so every season there is a period with each leading variety when it becomes a "drug on the market." This is especially true of the Bartlett. Prices accordingly fall. When the market is overstocked for a few days Bartletts may sell at from 75 cents to \$1.00 a box, while in two or three weeks they may bring from \$1.50 to \$2.50 per box. A small concrete storehouse, with packing room above, will soon pay for itself.

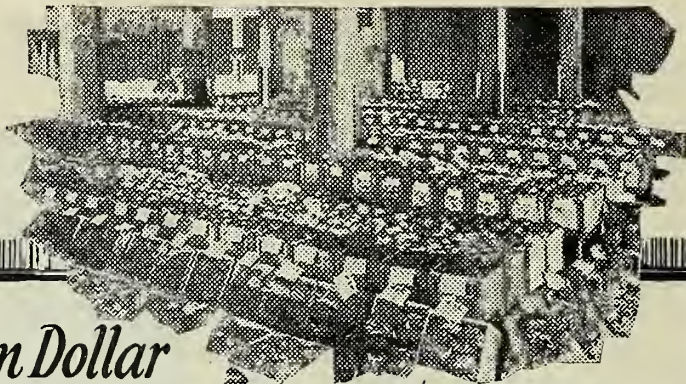
Grade and pack carefully as a good appearance goes a long way toward a good sale and will pay big wages for the extra time it requires. Always use new boxes, as no contrast is greater than fine fruit in old dirty boxes or scabby, ungraded fruit in fine new boxes. Don't sell all your best pears, but keep a few boxes of the finest for the folks at home. I know of nothing finer to the taste than a well-ripened pear just before retiring at night.

Do not plant pears for profit just because you happen to own a piece of mother earth. While pear trees will grow on almost any kind of soil and location, it does not signify that you can grow pears for profit. Make up your mind you are going to have a good, commercially paying pear orchard and select the soil and location best adapted for the specific purpose. If you don't know, get someone who does. Then do not be in a hurry. Put the soil in good fertile condition; buy the trees from an absolutely reliable nurseryman; plant with care, and then, above all, cultivate the soil continually the first three or four years, and at least every other year after that.

In the cultivation do not try to see how close you can get to the trees without barking them. Do a little extra work with the hoe and keep the horse and cultivator away from the trees.

I planted and have done the pruning of a large pear orchard for the last five years. This last season the owner of the orchard, a city man, had a very careless teamster plow and summer fallow the ground. I have just finished pruning the trees for the fifth season, and while I am not inclined to use strong language, it was hard to refrain. Of the 1800 trees fully 100 were practically ruined, large main branches broken off at the trunk, barked down to the ground and the tops eaten off by the horses. Five hundred or more were barked on the trunk by the singletree and, altogether, the trees were in a deplorable condition. Next season someone else will cultivate or someone else will prune.

Use common sense, study local growing and marketing conditions, varieties best adapted to the soil, climate and markets, intercrop until the trees begin to bear, and there is no reason why a good profit cannot be made in growing pears.



## Million Dollar Companies Sell Their Fruits At Auction

66% of the Fruits sold through the New York Auctions are sold for the account of large Cooperative organizations and million dollar concerns like the United Fruit Co.

Big organizations can afford to hire big men to select the best selling methods. And big men, like big companies, do not make many mistakes. They *know* what they're doing before they make a move.

When concerns like these sell at Auction, isn't it a pretty safe guide for *you* to follow?

If you are dissatisfied with the prices you are receiving for your fruits—if you are displeased with the service you are getting, or with the delay in getting your money, then you will be interested in receiving full particulars about our 20th-century way of handling sales. Better let us send you full particulars anyway. What's your address?

# The Fruit Auction Co.

Established 1896

202-208 Franklin Street, New York City



KAYSO—the combined casein spreader and adhesive—simplifies the control of insect pests and fungus diseases. It is safe and convenient.

You can use KAYSO at a cost of substantially less than one cent per tree. Against this—count the cost in the low yield of your orchard when poor spraying methods are practised.

The casein used in KAYSO manufacture is specially pre-

pared for the purpose, properly pulverized and completely soluble.

Use KAYSO with Bordeaux-Mixture, Lead-Arsenate, Nicotine-Sulfate and Sulfur Sprays.

Ask your dealer or write today for prices and circular.

## CALIFORNIA CENTRAL CREAMERIES

425 BATTERY ST.  
SAN FRANCISCO

175 FRANKLIN ST.  
NEW YORK

740 TERMINAL ST.  
LOS ANGELES



## Wasco County's Plan

IN ORDER that greater development of agricultural and horticultural resources of Wasco County may be obtained, The Dalles-Wasco County Chamber of Commerce recently formed a bureau which has been designated the Agriculture and Horticulture Bureau. W. S. Nelson, connected for the past four years with Libby, McNeil & Libby, is in charge of the bureau.

Mr. Nelson's thorough knowledge of the cannery business well fits him for the position of adviser to those planting new acreages, in seeing to it that an adequate tonnage of each variety is planted to assure a real commercial output. This, in turn, will assure an outlet. For instance: If one man plants an acre or two of red raspberries, another strawberries, another loganberries, another peaches, another pears and still another something else, there will not be tonnage enough of any one kind of fruit to make advantageous sales possible, either to a cannery or in packed form.

Another function of the bureau will be the scientific analyzing of soils to determine for what crop they are best fitted. Through co-operative methods of city and country and the application of practical plans, greater development of areas now farmed and those undeveloped will be obtained. The ranchers are enthusiastic over the new plan and are approving it by setting out orchards on lands not now planted,

or clearing and preparing undeveloped areas within their holdings for early orchard planting.

Various tree fruits have been successfully produced in quantity and quality during past years so the land owners are well informed as to the adaptability of certain fruits to the various valleys and uplands. The gardening experience of these farmers furnishes the guide post as to the crops that can best be grown and marketed and it is upon this experience that future development will go forward without useless waste of effort, time, material or money.

There will be no printing of pamphlets, say the bureau heads, telling of glowing possibilities in order to secure immigration. While more people are wanted and needed, those that come will have the use of the bureau at their disposal and will receive thorough and reliable information and be guided by all protective means possible in securing their location and being advised as to what crops may be successfully grown and marketed. After all is said and done, the human factor is all important in development and the success of the individual is the success of all.

▲ ▲ ▲

BETTER FRUIT is a mighty fine magazine and I sure like to read it. I am interested in filberts at present and want to set out a grove of them.—Cicero Grimm, Aurora, Oregon.

## Codling Moth

This destructive pest requires utmost vigilance. Use ORTHO DRY ARSENATE OF LEAD. Uniform in strength. Mixes perfectly, and stays in suspension a long time.

Write for Ortho Circular

CALIFORNIA SPRAY-CHEMICAL  
COMPANY  
WATSONVILLE, CALIF.

Address Dept. F.



Northwest  
Orchard  
Ladders

"The Quality Line"

For Sale by  
Leading Dealers Everywhere

Manufactured By

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PORTLAND, OREGON

**APPLE LABELS**  
by attracting attention  
by compelling interest  
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**PLAY AN IMPORTANT PART IN  
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SEATTLE • LOS ANGELES • FRESNO  
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MANILA  
SAN FRANCISCO



## Orchard Cultivation and Improvement

(Continued from page 6)

a single element is wanting or whether two, three or none should be given to the soil.

The value of the fertilizers can ordinarily be found indicated in the growth of the cover crops or of the weeds and grasses in the orchard. Ordinarily the cover crops will respond to the needed fertilizer more quickly than will the trees, but if the cover crop shows marked difference in the way it responds to the fertilizers, it is fair indication that in time the trees will show very much the same development.

In adding fertilizer to the soil for these tests it is suggested that a good plan is to apply them very early in the spring in heavy rainfall districts, or later in the fall in the lesser rainfall districts. These materials should be cultivated into the soil soon after being broadcast on the land. All material should be carefully pulverized and scattered over the entire surface of the soil. A few tests in any section will ordinarily be a good indication of what the district may find in soil needs.

For example, so far as I have been able to learn, in the entire section of western Washington, south of Chehalis, the sandy, gravelly and light soils that have been cultivated for 20 years are most generally found to respond to the application of nitrogen fertilizer. In the northern part of Washington, I am led to believe that both nitrogen and potash fertilizer are beneficial to most of the lighter soils. Phosphorus has given encouraging results in a good many districts.

**CAUTION ON COMBINATIONS**—I want to caution against the combination of fertilizers such as the use of phosphorus and barnyard manure or the application of potash with the green cover crop and then drawing the conclusion that this cover crop was of little or much value to the soil or that the use of the special fertilizers was the thing that gave all of the valuable results. The use of barnyard manure, well handled, improves practically every type of exhausted or worn out agricultural land and the mere fact that phosphorus or potash, or nitrogen was used with this material and that good or better crops were received does not prove that the benefits would not have been derived by the use of the decaying vegetation alone.

I am always in favor of advocating the use of commercial fertilizers where they prove profitable, or where every other process possible to be applied has been used without securing all of the crop improvement desired. Our orchard soils are capable of so great improvement through use of cover crops and the application of the farm produced fertilizers that I hesitate always to recommend without caution the use of the commercial materials.

It is especially important that the farmers and fruit growers so organize and



**Miller's Perfect Spreader**

Ready for use—Simply sift into the spray tank

Oregon Growers Co-operative Association  
Affiliated With Oregon Growers Packing Corporation

ROGUE RIVER DISTRICT

Triangle



PEARS

Brand



APPLES

JAS. E. EDMISTON  
Manager

Medford, Oregon,  
April 22, 1922.

Miller Products Company,  
Box 826  
Portland, Ore.

Gentlemen:

I want to express to you my entire satisfaction with your casein spreader sold under the trade name "Spreado". I used this product on two hundred acres of my orchard in 1921 and found that it did everything claimed for it by your company. The use of "Spreado" gave us an especially uniform coloring on our red varieties and I consider it especially valuable for spraying red fruits.

It is reported to me that tests conducted by the Bureau of Chemistry in Washington on samples taken from my orchard showed that all of the fruit carried a greater amount of Arsenate than did a similar number of samples of the most heavily blotched fruit where no Spreado had been used.

We experienced no trouble whatever in getting your product to go into solution and actual tests conducted by me showed that in spraying both apples and pears, a considerable saving is effected in the amount of material required to cover a tree by using "Spreado".

I shall use it in every Arsenate spray in 1922.

Yours very truly,  
OREGON GROWERS CO-OPERATIVE ASSOCIATION  
  
Mgr. Rogue River District.

JEE:LV

Use "Spreado" in your calyx spray


**Spreado**

the original and first commercial spreader, has been tried and proven, and is handled by the largest Associations of the northwest. INSIST on "SPREADO."

**WHY?**

Because "SPREADO" always gives excellent results. Apple Growers' Ass'n, Hood River; Oregon Growers' Co-op. Ass'n., Salem, Oregon, Producers Service Company, Distributors, Yakima Valley. Yakima Fruit Growers' Ass'n, Yakima; Yakima County Horticultural Union, Yakima. Apple Growers' Ass'n., Hood We also sell ultra-fine casein.

**Miller Products Company**  
Portland, Oregon  
Manufacturers



May is *Arsenate of Lead* month. Get your order in now. (The supply may be limited.)

**GRASSELLI**  
Arsenate of Lead, Calcium Arsenate, Lime Sulphur Solution, Bordeaux Mixture.

**GRASSELLI GRIDE Arsenate of Lead means—**

1. It is actual GRASSELLI grade—the same famous quality that has made GRASSELLI the foremost name in the chemical world.
2. It has the certified purity, strength and uniformity of all Spray Products bearing the Grasselli Label and Guarantee.
3. It is backed by Grasselli's 83 years of leadership in the chemical field—our carefully guarded reputation is your protection and warranty.

Ask for GRASSELLI Insecticides and Fungicides and INSURE RESULTS in spraying.

Established 1839

**THE GRASSELLI CHEMICAL CO., CLEVELAND**

develop their farms that the purchase of material necessitating cash outlays will be kept to a minimum, so the cash returns derived from the sale of products can, to the largest extent possible, be considered as labor income. There is no more perfect manufacturing plant than our orchards and farms and if we fail to use them to their

fullest capacity we suffer a waste and this waste is directly charged against the profits possible to be derived from them.

**COVER CROPS** are used to a large extent in the eastern orchard districts and I think the use of orchard cover crops west of the Cascades has not been developed to



anything like a maximum value. There is great variation in the type of soil. The different kinds of fruit grown of necessity require different systems of soil management. The climate and soil are generally fitted to the production of large quantities of vegetation. If properly farmed the climatic resources are sufficient to maintain a high degree of soil fertility for an indefinite period.

The system of orchard management which will include the planting of cover crops in the later summer or early fall and the turning under of these crops during the spring is a plan capable of being used in practically all western districts of heavy rainfall. If such crops as vetch, wheat, rye, field peas and crimson clover are used, the fertilizing of the soil can be very much improved and, in practically every case, the texture of the soil very greatly improved. In some districts it will be necessary to depend upon the growth made in the fall to develop enough vegetable material to make the cover crop worth while, as late spring growth can not be permitted. Where the rainfall during the spring and early summer is light, the cover crop would soon exhaust the water supply.

Another condition that seems peculiar, yet the local men are convinced of its potency, is that in the prune orchards of Clarke county the orchardists who plow early, more generally escape injury from light spring frosts than the orchardists who plow late. They are convinced of this fact to such an extent that it is recognized as a profitable practice to plow early.

The plowing under of the cover crops in the early spring does not permit of a heavy development of vegetable material, but it has one very great value—that of preventing a complete leaching of the soil during the winter. This, in itself, can do a great deal to maintain the soil fertility.

I do not know to what extent the practice of mulch crops and sod mulch crops could be used in Washington or Oregon. I know that in the eastern part of the United States, with rainfall varying from 35 to 50 inches, many orchardists find it profitable to permit a crop of clover and grasses to occupy the entire land. This material is cut as soon as it reaches the hay stage of development and permitted to fall and lie on the ground during the rest of the season. A large amount of material may grow the second time and must be cut a second time, but all of the material grown on the land is permitted to fall and decay there.

The value of this process increases as the orchard attains age. For the first year or two it may seem that the orchard suffers a bit from want of water, but as the mulch increases in thickness on the soil surface, the water-holding capacity of the soil and mulch is increased and the trees do not suffer from want of water as might have been expected.

## Are there CURLED LEAVES on Your Apple Trees



Then get busy. That's a sure sign of Aphis. These little insects are sucking the life out of your trees. Kill them unless you want a small crop of dwarfed, specked fruit. You also run the risk of Aphis killing your trees.

Spray at once with

### Black Leaf 40

40% Nicotine

Kills  
Aphis

Recommended by agricultural colleges and experiment stations. Don't make the very common mistake of thinking that Lime-Sulphur, Arsenate of Lead or Bordeaux kills Aphis. They don't, but if you are using those sprays, simply add Black Leaf 40 properly diluted, and make one spraying do double duty. Aphis also attacks Peach, Plum, Cherry as well as many vegetables and plants. Black Leaf 40 is highly concentrated so that only a small amount is required. The cost is small—only a few cents per tree. Free Spray Chart. Your dealer has Black Leaf 40 and one of our free spray charts. If he is out, write us direct.

### Tobacco By-Products & Chemical Corporation

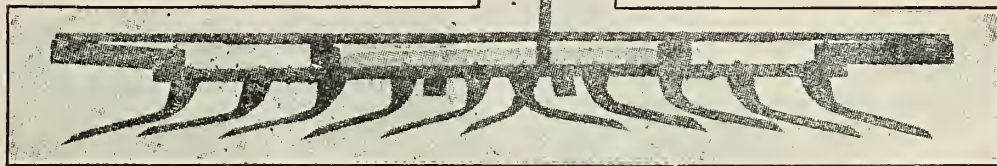
Incorporated

LOUISVILLE, KY.

## THE KIMBALL CULTIVATOR

DEATH to fern and other  
noxious WEEDS.

LIFE to your fruit  
TREES.



**M**OISTURE is absolutely necessary to wood growth and fruit production. Without adequate moisture in your soil, fertilizers will not become soluble, hence will not operate when you need them. Too much irrigation is admittedly dangerous.

Your KIMBALL will hold the natural moisture in your soil by forming a perfect mulch, eradicating weeds at the same time. After your spring plowing and discing the KIMBALL is the only tool you need through the balance of the season.

### W. A. JOHNSTON, Mfg.

The Dalles

Oregon



## Factors Inducing Calyx Spray Injury

(Continued from page 7)

tivation last year. The block immediately adjoining it had had continuous excellent cultivation. Both blocks were sprayed by the same man with the same strength of lime-sulfur. The improperly cared for block suffered from very severe leaf burn and leaf drop, while the other block disclosed not the slightest trace of spray injury.

There are other conditions that contribute to lime-sulfur injury that must be also mentioned because even the poorly cared for orchards escape serious spray burn in many seasons. One of these is the weather. After a period of long continued moist and cloudy weather apple foliage even on trees of good vigor is apt to be unusually sensitive to spray injury. The fact that such conditions prevailed to an unusual extent last spring will account, in part at least, for the very unusual and widespread spray burn met with all over Western Oregon last year. In the average year this danger of ultra-sensitiveness is not to be expected; but when it does exist it is the vigorous and well cultivated trees that suffer the least.

IN SEASONS like that of 1921, the condition known as sulfur-shock is also far more evident than in the normal season. Sulfur-shock is the result of applying lime-sulfur spray on well developed foliage which has not been rendered resistant by earlier application of this material. It is particularly noticeable when the delayed-dormant and pink scab sprays have not been applied and the leaves get their first lime-sulfur spray after the petals have fallen. At times it may be so serious as to cause a large part of the leaves to drop. While marked sulfur-shock may not occur in Oregon in the average season yet it is important that the early spray should be given every year, not only for the resulting scab control, but as something of a protection against sulfur-shock in the later sprays.

Much spray burn occurs in years when weather conditions have been especially favorable for scab development. This burn may not result in any way from the sensitive condition of the tree, but is very often due to unsatisfactory spraying or a neglect of early applications whereby an abundance of scab spots have developed on the leaves. The scab fungus always breaks the leaf skin and wherever lime-sulfur spray touches a scab spot it penetrates into the leaf tissues and kills them, causing brown burned areas to appear. Scab spot burn is naturally to be avoided by putting on a thorough spray program from the very start and thus preventing any extensive development of infections.

Temperature has an important effect on the activity of sulfur sprays. In hot weather, weaker dilutions of lime-sulfur should be used. No accurate experiments

have yet been conducted to determine the exact relations of temperature to sulfur sprays, but the Crop Protection Institute is, I understand, about to undertake such studies during the coming season. These should give us some very valuable information which has long been needed. It is to be hoped that in these investigations efforts will be made to determine how spray injury may be avoided under all circumstances. Meanwhile the grower must follow with care such practices as will keep his trees in the most vigorous condition possible, applying the early protective sprays faithfully and using greater dilutions in hot weather.

## Action of Spreaders

SUCCESS of the calyx spray depends largely upon success in getting the spray into the calyx cup, according to an expert who has made a study of the matter. He has a tested theory as to the best means of accomplishing this, which he sets forth as follows:

"To send the lead spray into the calyx cup, real driving power behind the droplets is necessary. Hence we use high power. But the higher the pressure used the finer are the droplets and the resultant mist. Obviously the driving power behind the droplets becomes less as the mist is made finer.

"On the other hand the use of a coarser nozzle and coarser droplets it not so effective because the droplets run off too freely. Here comes in the use of a spray spreader. When a spreader is used in the spray, the drops, even though kept somewhat coarser, spread over the calyx cup when they strike it and carry the lead where it must be if the apples are to be protected against the first brood of codling moths. This property of a spreader gives the added advantage of enabling the sprayer to cover the tops of the trees, where the finer mist cannot be driven."

For the Control of Aphis—

## Spray with APHOIL

Which is also an efficient Spreader

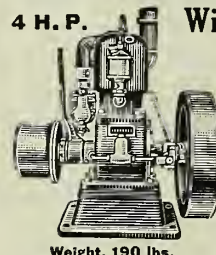
Write for information

**Hood River Spray Co.**

HOOD RIVER, OREGON

Manufacturers of DORMOIL

## Greater Capacity and Pressure 4 H. P. With a Lighter Engine



Weight, 190 lbs.

That's what the fruit grower needs in spraying to produce the desirable "fog spray." In order to secure greater capacity and pressure, with lighter weight, leading manufacturers of sprayers have now standardized for their power on the high grade

## CUSHMAN

The 1½ H. P. Cushman handles the smaller sprayers of 3 to 4½ gallons at 200 to 300 lb. pressure.

The 4 H. P. Cushman (weight 190 lbs.) is the proper size for the larger triplex orchard sprayers with a capacity of 8 to 10 gallons at 250 to 300 lb. pressure or more.

The 8 H. P. Double Cylinder Cushman, weighing only 320 lbs., is the ideal engine for the largest orchard and standard shade tree sprayers.

**Rebuild Your Sprayer**  
with the famous Cushman Engine and get more power and pressure with less weight.

Write for free Catalog, mentioning the sprayer you have or expect to buy. (13)

**CUSHMAN MOTOR WORKS**

978 N. 21st Street

419 East Ash St.,

Lincoln, Nebr.

Portland, Ore.



## FREE CATALOG

Sash, Doors  
Millwork

Hundreds of beautiful designs direct from the manufacturer at money-saving prices. Send for your copy today.

ROVIG  
LUMBER  
CO.

2205 First Avenue S.W., Seattle.

The Clarke County district in Washington is said to be capable of producing 10,000,000 pounds of prunes under normal conditions.

Michael H. Walsh, horticulturist internationally known as the originator of the Rämber rose, died April 10, at his home in Massachusetts at the age of 74.



## Advertising Plans

From nearly every section of the Pacific Northwest comes word that the growers are this spring raising special funds to be expended in the advertising of the Northwest's boxed apples. Wenatchee growers propose a fund of \$250,000. Hood River and Yakima districts and the Idaho State Horticultural Association all have under consideration plans for such a fund, or have actually arranged to collect one. The need and value of such concerted advertising has been made apparent. Far-reaching benefits are sure to result if the growers do not lag in this good work.

## WASHINGTON

**R**EPORTS from Wenatchee are to the effect that several hundred acres of new orchards and berry fields will be set out in that district this season. On lands just brought under irrigation in Grant County there will be heavy plantings of peaches and apricots, with strawberries, loganberries and blackcaps as fillers. In the Tonasket-Oroville section many apple trees are to be planted, with apricots and smaller fruits as fillers.

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**A**CCORDING to report of Henry Huff, district horticultural inspector stationed at Puyallup, the total value of fruit and vegetable crops in the district in 1921 was \$2,161,849. Local canneries and plants used 7,701 tons of fruits and 780 tons of vegetables. Fruit shipments totaled 4,853 tons and vegetable shipments 3,996 tons. New acreages this spring are to aggregate 600 acres of raspberries, 185 acres of evergreen blackberries and 150 acres of loganberries.

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**W**ENATCHEE'S special committee on apple advertising will recommend that a fund of at least \$250,000 to be obtained through an assessment of 2 cents a box and subscriptions of shippers and business men, be raised this season to be spent through a capable advertising agency. After details of the proposal have been announced a referendum will be taken among the growers to make sure they approve so large an expenditure. The committee which framed the plan is composed of John R. Peters, O. B. Shay, John R. Everett, J. M. Wade and Edwin Smith.

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**A**NNOUNCEMENT is made that M. L. Dean has resigned his position as head of production and inspection department of the Wenatchee District Co-Operative Association. Dean, who is secretary of the Washington State Horticultural Association, held his position with the co-operative association a little more than a year. He was formerly with the State Department of Agriculture.

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**C.**A. HUNTLEY of Yakima has been made horticultural inspector in Pacific county, where he will particularly look after cranberry problems and production in the bogs of the county. For some time he has been doing work for the state department of agriculture in Thurston county.

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**F**OR THE FIRST time in two years the Vancouver Prunarians will stage a prune harvest festival this year, according to unanimous vote at a recent meeting. Business conditions have so improved it is felt that the affair can again be made a big success.

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**P**RUNE, POTATO and strawberry growers of Clarke county, affiliated in the Washington Growers' Packing Corporation, have been so well pleased with last season's results that new members are daily being signed up, according to Man-

ager E. J. Newhouse. Eighty per cent of the prune growers are members, and 90 per cent of the county's strawberry crop is handled by the association.

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**I**T HAS BEEN announced at Montesano that an active pear planting campaign will be waged this summer and fall by the Montesano Packing company. W. C. Mumaw, the manager, is also urging the planting of more Montmorency cherries.

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**A**BOUT THE middle of April the green aphid pest showed rapid spread around Chehalis, according to Deputy Horticulturist Albert. He predicted that this season will be one of the worst yet experienced with this pest and began a campaign of spraying to eradicate it.

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**U**NUSUAL AMOUNTS of spray materials and fertilizer have been purchased by growers of Clake county this spring. Coupled with the fact that special attention has been given to pruning this must be taken to indicate that orchardists and farmers are taking better care of their trees.

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**J.**W. EGAN is having 14 acres of loganberries planted on a tract of 15 acres near Walla Walla, it is reported. He will interplant potatoes in the tract this year.

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**T**HE LARGEST strawberry planting reported from the upper valley at Yakima for this season has been made by William Lee, who has put out five acres berries of the Nick Ohmer variety. Mr. Lee's ranch is at Naches.

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**D.**A. McDONALD is said to be setting out ten acres of pears at Donald. He is planting the Bartlett and Winter Nelis varieties.

## OREGON

**H**IGHLY important experiments in cherry pollination are being conducted in Wasco county this season by Professor C. E. Schuster of Oregon Agricultural College. He will have a corps of assistants and will be aided by County Agent Jackman and Horticultural Bureau Chief Nelson. The experiments are expected to produce data on the problem of cherry pollination that will be of far-reaching benefit to growers and experts of the nation.

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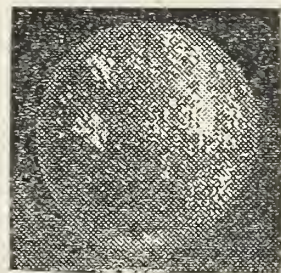
**A.**L. PAGE has sold his east-side orchard at Hood River to R. Starkell, former Walla



## Prevent

the "blotch" or "burn" of the  
spray on fruit

Observe this study in contrasts. The apple at the left was sprayed with Arsenate of Lead—a wonderfully good spray. But the user neglected to mix "Spray Spread" with it. Below is a similar apple—sprayed with the same kind of spray—but Albatross Spray Spread was mixed with the spray. Note the difference—the "lead" dried on the FIRST apple in



Note the "blotch" or "burn" of the lead on this apple

spots or blotches. The second apple received an equal amount of protective spray—but it spread over the apple in a thin film. Appearance and marketing appeal of the apple is thus retained. The pictures tell why Government experts are so enthused over "Spray Spread"—why experienced horticulturists say it has NO equal for spreading an "arsenate of lead" spray.

ALBATROSS  
"SPRAY SPREAD"

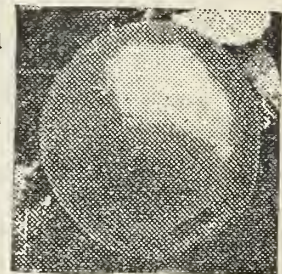
(Calcium Caseinate Compound)

The Original and Genuine Spray Spreader

## Quality Features:

1. Very finely ground—always uniform.
2. Quickly Soluble.
3. No lost time.
4. Protects fruit with uniform coating.
5. Does not injure foliage.
6. Recommended by experts.
7. Guaranteed by manufacturers.

Directions sent with each order



Note the uniform, adhering film on this apple

## PACKAGES

Write for Prices

200 lb. Bbl.      Boxes      1 lb. Pkgs.  
Freight prepaid to Northwest points.

**NOTE:** If you use Casein, specify ALBATROSS Superfine. Also call for Albatross Dry Bordeaux.

General Basic Products Co., Sole Manufacturers, 4796 E. Marginal Way, Seattle, U. S. A. **Dealers:** Address us for attractive sales proposition.

## TREES AND SHRUBS



Fruit trees budded from bearing orchards. Apple, Pear, Cherry, Peach, Plum, Prune, Apricot, Quince, Grape Vines, Strawberry, Plants, Raspberries, Blackberries, Logans, Dewberries, Asparagus, Rhubarb, Flowering Shrubs, Roses, Vines, Hedge, Nut and Shade Trees. Carriage paid. Satisfaction guaranteed.

**WASHINGTON NURSERY CO.**

Toppenish, Washington.

Salesmen everywhere. More wanted.

Walla fruit man. The price for the 10-acre tract is given as \$9,500. Mr. Page immediately purchased from Russell A. McCullay a neighboring ten acres of bearing orchard for \$10,500. F. H. Kingdon has bought the 10-acre tract of A. E. Digman, on Neal Creek and Albert and Herbert Krusow have acquired an adjoining ten acres from W. F. Laraway.

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**A**CCORDING to decision of the state supreme court the grower members of the Salem Fruit



Union who contracted in 1917 to deliver their loganberries to the Phez Company must comply with terms of that contract. Numerous growers broke the five-year contract when more attractive prices than those stipulated were offered by other buyers.

ON APRIL 14 the berry growers of the Gresham district held their second series of field meetings, visiting the yards of numerous growers for a study of production methods and practices.

MORE THAN 4,000,000 pounds of fruit was handled by the Producers' Canning and Packing Company at Salem, during 1921, it was shown by the annual report recently submitted to stockholders. A substantial profit was passed into the building and improvement fund. G. W. Needham was elected a director to succeed K. D. Kugel.

J. W. HICKS, former Oak Grove orchardist and for a number of years on the inspection force of the Apple Growers' Association, has been appointed temporary deputy fruit inspector in Hood River county. He now has charge of nursery stock inspection and will officiate during the strawberry season in case a county inspector is not named by that time.

I. R. ACHESON, who has been serving as director of sales of the Hood River Canning Company, particularly in the East and abroad, returned recently from a tour of the United Kingdom. He spent a month in England and Scotland and found business conditions fast improving there, he reported.

ACCORDING to Dr. C. A. Macrum of the Mosier Fruit Growers' Association, there will be extensive plantings of Blenheim and Clinton apricots at Mosier this season. Other plantings will include a considerable acreage of plums, cherries and pears.

AT PINE GROVE, in the Hood River district, J. C. Porter, ex-director of the Apple Growers' Association, has sold 27 acres of orchard to George T. Gallagan and L. E. Ireland has sold 27.7 acres to F. M. Peugh. The purchasers already owned orchards in the same section.

THE APPLE Growers' Association at Hood River has re-elected all its old officers, as follows: E. W. Birge, president; R. J. McIsaac, vice-president; C. King Benton, secretary.

#### CALIFORNIA

CONDITIONS in El Dorado county have proven highly favorable for cherry growing and acreages there are rapidly expanding. Heavy plantings of trees have been made in Pilot Hill and Cool districts, most of them above the irrigation ditches. The growers plow the land twice each spring to provide a soil mulch.

THE MINIMUM wage for women in the fruit canning and packing industries of the state was recently fixed at \$15 a week. This is a reduction of \$1 a week under the minimum scale that prevailed last season.

UNDER PROVISIONS of the new laws on fruit and vegetable standardization strawberries may be sold in California only in standard baskets containing a dry pint. Under no circumstances may the old half-pint basket be used.

IN NUMBER of nurseries California leads the country, with 540. New York, ranking next, has 359. New York has 5288 acres devoted to nurseries, containing stock valued at \$2,310,253. California has 4080 acres on which the stock is worth \$2,920,458.

CONSTRUCTION of a new temporary Department of Agriculture building in Sacramento at Tenth and L streets, is being rushed and it is said there will be great advantage in having all units house together in the new quarters.

UNDER THE urging of Theodore D. Urbahns of the bureau of pest control unusually careful spraying against the peach moth and peach leaf curl is said to have been done this spring in most peach sections of the state.

BY WAY of guarding the chestnut industry which has had a favorable start in the state, the state quarantine guardian is attempting to keep out all shipments of trees coming from eastern states where chestnut bark disease is prevalent. The disease is said to have wiped out the industry in many eastern sections.

TOTAL SHIPMENTS of cherries and peaches from California to the east in 1921 were slightly greater than in 1920. Cherry shipments showed the greatest increase there having been 665 carloads as compared with 494 carloads in 1920. Peach shipments increased from 3,107 carloads to 3,333 carloads, while apricots decreased from 312 to 284 carloads.

FIFTY ACRES of Bartlett pears are being planted in the Upper Sutter Basin district by Perry Hiatt, together with ten acres of cherries.

THE TERRA BELLA peach growers have completed arrangements for marketing this season's crop through the California Canning Peach Growers' Association, organized recently.

IN NAPA county an observation experiment in which 28 varieties of prunes are to be produced on one orchard, has been arranged. The object of course is to learn which varieties do the best.

#### IDAHO

LETTUCE growers of Idaho have organized and have adopted standard grades for their product. Except for slight changes the grades correspond to those of California. W. S. McBirney was elected president of the growers' body and A. C. Saxton was named secretary.

PRUNE growers of the Boise valley district have formed a corporation to take care of the marketing of their crop. Last season the valley shipped about 100 cars of green prunes, of which more than 50 cars were handled by the growers' association.

AT A RECENT stockholders' meeting of the Boise Valley Growers Inc., composed of prune growers, it was voted to change the name of the association to the Boise Valley Prune Growers, Inc. These were the officers elected: Fremont Wood, president; F. H. Chamberlain, vice-president; P. P. Garvin, secretary-treasurer.

A SPECIAL committee to develop plans for advertising northwestern boxed apples was appointed recently by the State Horticultural Association. The report of the committee will soon be ready for consideration. Fruit men on the committee are: T. O. Hyslop, Twin Falls; J. J. Steel, Parma; A. E. Gipson and J. J. Allison, Caldwell; Dr. E. F. Coleman, Kuna; John Moulton, Weiser; Harry Yost, Meridian; Lee Truax, Boise; D. VanHoesen, Council; L. S. Yoder and Harry Richards, Nampa; Guy Dalton, Emmet.

AT BONNER'S FERRY the Boundary county Potato Growers' Association has been organized and a large number of growers have signed up a three-year agreement with the association. The directors are: George Kindschuh, Emil Frank, J. M. Billings and O. H. Campbell, of Bonner's Ferry and J. A. Morice of Naples.

### Dusting of Trees, Vines, Etc. Bleaching, Etc.



ANCHOR BRAND SUBLIMED VELVET FLOWERS OF SULPHUR, also EAGLE BRAND and FLEUR DE SOUFRE, packed in double sacks, are the FLUFFIEST and PUREST sulphurs that money can buy.

The fine, light, SNOWFLAKE-LIKE particles float to every surface and crevice of the plant.

Do not adulterate these sulphurs with any inert material such as lime or Kaolin, etc. Coating the sulphur particles with an inert material PREVENTS the FUMING ACTION caused by the sun's rays.

Send for Circulars 6, 8 and 10 about our "Toro" Brand Agricultural Compound and booklet "The Truth About Sublimed Sulphur," also price list.

### San Francisco Sulphur Co.

624 California St.

San Francisco, Cal.

**BEE SUPPLIES**  
ready for immediate  
shipment  
**Quality Goods at  
Reduced Prices**  
Write us  
**Superior Honey  
Company**  
OGDEN, UTAH  
"Everything in Bee Supplies"

**B E E S**  
**The Diamond Match  
Company**  
APIARY DEPARTMENT  
Manufacturers of Bee Keepers'  
Supplies  
Chico, California, U. S. A.  
(The largest bee hive factory in the  
world)  
Write for catalog and discount sheet; and,  
if a beginner, for Cottage Bee-Keeping, also  
for particulars of the MacDonald Aluminum  
Combs.

Why Not Order Now?

## TREES

For Resetting or New  
Orchards

Our supply will take care of  
your needs and you will  
receive stock which is well  
grown and reliable.

**Capital City  
Nursery Company**

426 Oregon Building  
Salem, Oregon

WE NEED SALESMEN



## With the Poultry

### FEEDING OF CHICKS

THE newly-hatched chick should not be given food until it is at least 48 to 72 hours old. This is important. The yolk which is only partly used as food during the incubation period, is drawn into the abdomen just before the chick emerges from the shell. The yolk furnishes sufficient nourishment to keep the chick alive for a number of days. This factor is what makes it possible to ship chicks long distances.

Feeding the chick too soon after hatching results in disarrangement of the digestive tract and retards the normal absorption of the yolk. It thus remains unabsorbed in the body of the chick and finally causes its death.

The first food the chick should receive after being removed from the nest or incubator, says an instructor in poultry raising, is clean, fresh water with the chill removed. The young chick drinks a great deal of water and plenty of it is necessary for its health and development. Also provide grit (sand), and charcoal, (chick size), for it to pick at. These ingredients start the digestive tract and digestive juices to functioning so that they will be in better condition to digest the first food eaten. Lusty chirping indicates that it is time for the first feeding. The first food should be of an easily digested nature. Oatmeal, dry bread crumbs, or a mash mixture of ground feeds, make very good starting foods.

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### TEN IMPORTANT RULES

ONE OF the poultrymen at the University of Wisconsin has ten rules for rearing chicks which he religiously follows. Here they are:

Use healthy, active and if possible free range breeding stock.

Have hover warm enough, so chicks will not crowd underneath. A cold hover is dangerous.

Give milk or buttermilk to drink from start and for the first ten days feed at least five times a day but very little at a time.

Very important—keep the chicks busy and do not feed enough scratch feed to fill their crops more than one-third full except the last feeding at night.

Do not have any draft where chicks sleep.

Watch chicks closely at bed time, so that they do not crowd or get into corners.

No matter how cold, get chicks out of doors as soon as possible, but so they can run to hover whenever they wish.

Commence feeding green feed when about a week old, preferably having chicks run on green clover.

Give plenty of room and air as chicks grow.

Keep close watch for mites; for if they are not controlled, no chicks can be raised.

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### FOWLS OF FINE FEATHERS

THE ornamental breeds and varieties of chickens often have an unusual appeal. A breeder who may be first attracted to such fowls by their unusual plumage may develop a flock later which has decided utility value, an activity which thus responds to the desire for something exceptional, and at the same time profitable. Farmers' Bulletin 1221, issued recently by the United States Department of Agriculture, on "Standard Varieties of Chickens," is the fourth in a series from the Bureau of Animal Industry.

The present bulletin treats of the principal reasons for keeping chickens, and goes into particular detail regarding the fowls in these classes: Polish, Hamburg, Game, Oriental (in which are the Sumatra and Malay,) and two miscellaneous breeds, the Sultan and the Frizzles.

The poultry industry of the United States is concerned mainly with the production of food, but in addition to this there are fowls of much

beauty of plumage or form kept merely for pleasure, because of their rarity or unusual appearance. It is this latter interest which accounts for a large number of the breeds and varieties and for the variation in type, color, and color patterns.

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### FIGHTING THE MITES

ETERNAL vigilance is the price of keeping houses and coops free from mites. A mite is very small and difficult to see unless special search is made. They are usually found in cracks near the roosts. They appear as minute gray or reddish specks. When present in large numbers they often have the appearance of dust. Mites reproduce very rapidly and are a great source of annoyance to the hens when present in large numbers. The mites live by sucking the blood from the hens. A severe attack of mites will cause the hens to lose flesh and stop laying, and will oftentimes produce death.

To get rid of mites the houses must be carefully cleaned and then painted or sprayed with repellent material. A heavy spraying of coal oil followed in two or three days by giving the roosts and surrounding boards a thorough painting with crude oil will clean up the mites and keep the houses free for several months. This treatment should be applied twice yearly to all poultry houses as a precautionary measure against mites.

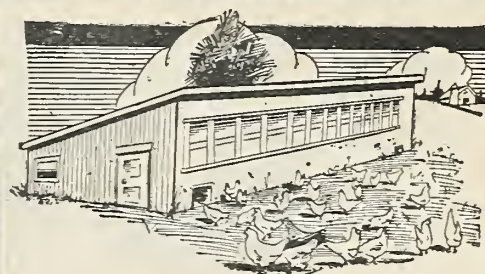
## Effects of Miscible Oil Spray

(Continued from page 9)

Most manufacturers of miscible oil sprays caution the use of these preparations during cold weather. They give no reasons, as far as I have been able to ascertain as to the probable cause of injury if unfavorable conditions are encountered. If the use of oil sprays on tree growth is sometimes attended with a certain amount of danger when applied under certain conditions this fact should be plainly stated on the receptacles containing the materials.

EFFECT ON THE TREES—Owing to the extreme cold weather which followed the spraying, the trees were watched very closely. According to some manufacturers trees sprayed with an oil spray go into the winter free from the injurious effects of insect pests. Furthermore, the soluble oils are supposed to have a cleansing and stimulating effect greater than lime-sulfur or any other spray. Apparently this appeared to be true with the trees under consideration for they came through the winter without visible injury. The trees leaved out and blossomed, but upon close examination, the leaves and blossoms were much smaller than those not sprayed. A few days later the owner again examined the trees and found many of them dead or in a dying condition. (See illustration).

This matter was immediately called to my attention and on making a personal examination of the trees I found the conditions as here noted. A detailed study of the trees showed a dark brown discoloration of the inner bark and a sour condition of the sap. This was particularly true when the trunk and larger limbs were examined. Brown streaks also extended some distance into the sap wood. The smaller branches showed small areas injured. Later



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examinations during the summer showed a very pronounced enlarging of the lenticles in the bark. That this condition was not caused by root trouble was evidenced by the rank sucker growth which came up from the roots.

This doubtless was purely a case of spray injury for the trees of the same variety in the same general region and growing under practically the same conditions that had not been sprayed were in a healthy vigorous condition.

Under some conditions miscible oil sprays may also cause more or less injury when applied in the spring. In the Clearwater orchard some Spitzenberg trees sprayed in the spring with the same material caused a very marked retardation of the buds from which they never fully recovered. These trees, however, no doubt



went into the winter in a very weakened condition due to the prevalence of blight.

Observations made last spring in the Payette Valley by Professor L. E. Longley also seem to substantiate the above statement.

Professor M. B. Waite, pathologist U. S. Department of Agriculture, states that "miscible oils are very often injurious to the peach, whether sprayed in the fall, winter or spring. Miscible oils are much more dangerous on the apple and doubtless on other fruits where applied in the fall or winter than when applied in the spring. We have had several rather striking cases of this, where miscible oils supplied by the same dealer were sprayed at different times. One very serious case of this sort occurred in a moderately young apple orchard at Winchester, Virginia, from December spraying. March spraying with the same material in several other orchards was not injurious."

**THEORY OF OIL'S ACTION**—While the exact physiological action of miscible oils on fruit trees is not generally understood a number of authorities have ventured an opinion. Dr. Felt, entomologist of the New York State Museum, is under the impression that oils penetrate the inner and outer sap wood destroying the living cells and preventing the normal circulation. This, if sufficiently general, may result in death of the tree.

Professor O. M. Morris, horticulturist of Washington State College, reports that "the oil sprays are very effective in slowing down the vital processes going on in the tree tops and if the material is applied while the trees are in their dormant state, the vital processes are slowed down to what would seem to be almost a standstill. In this condition they are able to resist and pass unnoticed any normally unfavorable condition of weather or disturbance of soil, such as transplanting, but are not able to endure the maximum unfavorable weather if prolonged. With a normal atmosphere and a coating of oil spray, the trees experienced what would be practically equal to a temperature of about 40 to 42 degrees below zero. This they could not endure if continued."

In addition to the above there are no doubt several contributing causes favoring penetration by oils, thus increasing the injury. Low winter temperatures causing vital activities in the trees to be at a minimum will no doubt drive the oil into the bark. Spraying just before or during a wet, sticky snow storm or during foggy weather will prevent the oil from drying, thus causing penetration.

**ONE** poultryman makes it a regular practice to plant a few artichokes in the poultry yards each year. The chickens do not eat the tops but enjoy them as shade during the hot days, he says.

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## Marketing News of Interest

**THOUGH** there has been a slight weakness in apple markets during recent weeks it has not been sufficiently marked to cause any concern over the manner in which the crop will clean up. The latest report from the east is here summarized:

The tone of the eastern apple market in general was slightly weaker, although prices of barreled stock showed little change at a general range of \$7.50@8.50 for best grades of Baldwins. A few markets made slight price concessions. Northwestern extra fancy Winesaps showed a few declines of 25c, but the general range held mostly \$3@4, with a slight weakness in several markets, but steady in New York and Kansas City.

Shipments, mostly from Washington and New York states, are steadily decreasing.

Storage stocks April 1 included 576,940 barrels compared with 996,004 March 1; also 4,062,913 boxes April 1, compared with 6,282,043 March 1.

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**A** TOTAL of 43,521 cars of apples were shipped from the four Pacific northwestern states during the period from July 1, 1921, to March 1, 1922, according to figures compiled at the office of the bureau of markets in the Spokane Federal building. These figures show an increase of 18,246 cars over the previous year, when 25,275 cars were shipped.

The Wenatchee valley shows the largest shipment with a total of 13,988 cars, an increase of more than 5,000 cars over the previous year. The Yakima valley is second with a total of 11,862, an increase of more than 4,000 cars over the year previous.

The Hood River-White Salmon district is next with a total of 4046, a gain of nearly 2,000 cars over the year previous.

The Idaho district shipped a total of 5830 cars, a gain of 3,000 over last year.

The Spokane district, which includes territory as far west as the Big Bend, north to the Canadian boundary, east to the Idaho line, shipped 2887 cars, an increase of 659 over last year's crop.

The district of eastern Oregon shipped 1563 cars, an increase of more than 1100. Walla Walla district shipped 1443 cars, as against 318 the year previous.

The Rogue River district of Oregon shipped 985 cars, as compared with 368 last year. Montana district shipped 672, as against 437, and the district of western Oregon shipped 524 cars, as compared to 322 in the previous year.

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**IT** WAS reported from Yakima, Wash., that for the week ending April 7 apple shipments from the Yakima valley aggregated 129 carloads. Latest estimates place the number of cars remaining on hand at 400, but it was said these would nearly all go forward before May 1.

On April 15 it was reported from Grandview, Wash., that there remained only 50 cars of apples in cold storage there.

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**A** RECORD price for the sale of Stevens county Netted Gem seed potatoes has been announced by F. A. Savage, manager of the Stevens county

## Washington Growers Packing Corporation Vancouver, Washington

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## POTATOES

**C**LARKE county certified seed potatoes are rapidly becoming known throughout the Northwest. Carloads of this valuable seed are being shipped out by this association to various parts of Oregon and Washington. We have been totally unable to fill the orders. These potatoes are grown in the same district that produced the winning potatoes in a recent contest at the Experiment Station at Pullman. Our potato manager, Mr. J. E. Larson, is nationally known as a potato expert. We specialize in Burbank and Netted Gem seed potatoes not certified.

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farm bureau. The returns on one car of pooled potatoes that the bureau shipped for its members averaged over \$60 a ton.



## Swarming of Bees

WHEN the field bees are confined to their hives by several days of rain just previous to or during the swarming season, the result may be a greatly increased tendency to swarm. Sometimes two weeks of rain at about the time of normal swarming season is followed by intense swarming. When the field bees remain in their hives a part of the time during the honey-flow because the flowers yield nectar erratically the tendency to swarm may be greatly increased. The presence of the great mass of field bees within the hive during the heat of the day from any of these causes must add greatly to the tendency to swarm, especially when the bees crowd in great masses in the space below the frames and in the lower portion of the brood-chamber, as they usually do when they are in their hives temporarily during the honey-flow.

There is, of course, no way by which the field bees can be prevented from staying in their hives, even if it were desirable to do so, but by providing a deep space below the frames and an abundance of ventilation, together with adequate protection from the direct rays of the sun, the discomfort of the colony brought about by the field bees within the hive during the day may be considerably relieved.

To prevent swarming to the greatest extent, says a late government bulletin, it is necessary to induce most of the hive workers to leave the brood nest early in their lives to take up work in the supers, so that the bees of the hive are distributed over a large comb surface which, in turn, should stimulate the field bees to go to the field in greater numbers. During the heat of the day no more bees should remain within the brood-chamber than are needed for the work to be done there. Such a distribution and employment of the hive workers usually induces the field workers to put forth the greatest energy in gathering nectar.

After having used all the known preventative measures, there will still be some colonies that attempt to swarm in certain locations during some seasons even in extracted-honey production, and in comb-honey production a large percentage of colonies may attempt to swarm. In either case, but especially in extracted-honey production, some of these swarms are probably a result of the imperfect application of preventative measures in time to prevent the beginning of the series of events which lead up to the actual issuing of the swarm.

The conditions within the brood-chamber are changed greatly by swarming, both in the swarm and in the parent colony. In the swarm there are no very young bees and, of course, no emerging bees during the first three weeks. The workers of the swarm that are not needed for the work inside the new hive are old enough for work in the fields, and when most of the bees of a colony can go to the fields for nectar during the heat of the day a surprisingly large number may be massed together in one hive without causing a stagnation of their activities. When the first young bees begin to emerge three weeks later the daily emergence of young is small in comparison with that of a colony during the spring brood-rearing period; therefore the swarms usually do not become greatly congested with young bees again during the same season.

Swarms that are hived in an empty hive on a new location seldom swarm again in the same season, especially where the season is short, but if they are hived on empty combs or combs containing honey or a little emerging brood they may do so. Even when most of the workers of both the parent colony and the swarm are reunited, or when two or more swarms are hived together in one hive, the bees are usually satisfied without further swarming if plenty of room is given in the supers.

The parent colony loses most of its field workers and the queen when a swarm issues, but it has a large amount of brood and several queen cells usually sealed or nearly ready to be sealed at the time of the issuing of the swarm. When the young queens begin to emerge about a week later

if the beekeeper does not interfere, the colony may cast one or more afterswarms, each accompanied by one or more of the recently emerged virgin queens. When there are no longer sufficient bees left to divide up among the emerging queens, all but one of the young queens are killed, this surviving one in the normal course of events later becoming established as the new mother of the parent colony.

The rapid emergence of young bees soon restores the parent colony to good strength, but when swarming takes place during the honey-flow the parent colony may not recover sufficient strength in field workers to take an important part in gathering the season's crop of honey. After the young queen becomes established a parent colony seldom swarms again in the same season, even though it may become quite populous and the season may be prosperous.

Thus neither the swarm having the old queen and the older bees in establishing itself in a new home, nor the parent colony having the young queen in reestablishing itself in the old home, is inclined to swarm again in the same season. In each case there is an interruption in the emergence of young bees. These are important facts in the control of swarming.

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I WOULD like very much the particulars and history of the various stages and organizations that the California co-operative fruit growers' went through prior to the time the present organization of the California citrus growers' was reached. If you have not the information, I would like the address of the secretary or manager of the above organization. I wish data to present to independent shippers in Okanagan.

W. A. B., B. C.

You can doubtless best obtain the information you seek by writing to the California Fruit Growers' Exchange, Los Angeles, Cal. The general manager or secretary will answer. If for any reason he does not give the needed information or cite you to it you might write the State Department of Agriculture, Sacramento, Cal.

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WILL YOU kindly give me the address of the secretary of the Idaho State Horticultural Society.

R. H., Wash.

I. Lee Truax, Boise, Idaho, is secretary of the Idaho State Horticultural Association.

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WILL YOU be so kind as to advise us as to who manufactures the branding machine the Skookum Association used last fall in branding apples. Will the machine work on soft fruit or vegetables, such as a tomato, for instance?

J. W. W., Wash.

The address is, Fruit Branding Corporation, Corporation Building, Los Angeles, Cal. Another branding machine, used particularly on walnuts, is put out under direction of A. L. Wysong, Care California Walnut Growers' Association, Los Angeles, Cal. We are advised that the electrical machine used by the Skookum Association would work satisfactorily on soft fruits or vegetables.

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